



Driving a School Bus Through Mountains, Hills and Inclines

Video Reference Guide and Test

INTRODUCTION

School bus drivers operate their buses on a variety of roadways. Some roadways have wide lanes to drive the bus on, while others are extremely narrow and leave minimal room for error. The video goes over many of the important issues, driving techniques, preparation and much more when it comes to driving the school bus through mountains, hills and inclines. In the video, we offer many tips that we have collected from drivers over the years who have driven these types of roadways throughout their career.

The host throughout the video is Bill Babbes, a Driver Instructor with 34 years in the school bus industry. He will be instructing Dwayne Stiggen, a school bus trainee, who at this point has racked up 12 hours of behind the wheel training at Black Oak Mine Unified School District, located in Georgetown, CA.

Introduction and Preparation

- 1) Driving a school bus through curvy, narrow roadways' presents many challenges for school bus drivers. Diverse driving skills are required to drive in these locations safely. With sharp curves, turns, grades, traffic, wildlife and changing weather conditions, you can see why plenty of practice and total concentration is essential during operation of the bus.
- 2) Equally important is being **PREPARED** to drive in these areas. These locations are not in areas where you can find a pay phone nearby, and in some cases there may not even be a house for miles. Here are some things to keep in mind when preparing to drive in mountainous and/or hilly locations.
- 3) Be sure to check the weather for the area you will be traveling in before heading out on your route or trip. **When you go up in elevation, weather can change dramatically.** Not only that, but at extremely higher elevations, mountains can create their own weather system. Since this can happen, you need to be prepared for all types of weather. You should come prepared by packing a poncho, an extra sweater and anything else you may need should temperatures suddenly change.
- 4) **It is also a good idea to carry a cell phone.** There are many instances when the 2-way radios cannot get through to dispatch and a cell phone can. It can't hurt having one on hand. Also, most smart phones have a GPS chip in them. In a really bad situation, that can be a lifesaver.
- 5) Part of preparation is to also prepare the school bus. **The Pre trip inspection is one of the most important parts of a school bus driver's job.** When driving in mountainous

and/or hilly locations, attention to detail during the pre trip inspection becomes THAT MUCH MORE critical.

6) Before driving in hilly or mountainous areas, you will need to make sure the bus is in PRIME running condition. **With mountain driving, you need to pay particular attention to the tires.** They will be taking on a lot of wear and tear from the curvy roads. **You should be inspecting and making sure that the:**

a) tire pressure on all tires is good.

b) tires have no cracks or bulges present.

c) tread depth on all tires are within the required depth.

(On the front tires, it should not be less than 4/32 inch. On the rear tires, no less than 2/32 inch.)

d) valve stem is secured.

e) lug nuts are all tightened.

7) **The other part of the bus that will take on the brunt of usage are the brakes.**

Properly inspecting the brakes cannot be stressed enough. Each and every test should require your full attention. DO NOT shortcut any part of the brake tests. **If you see any issues with the brakes or tires, bring them to the attention of your supervisor and mechanics immediately.** Having a tire blow or brakes fail on a steep downgrade would be a scary situation to be in and is the LAST thing you would want to happen.

8) That also goes for pre tripping everything else on the school bus. **Nothing should be overlooked. Take the time to correctly pre trip your bus and do not rush while doing so.**

9) In addition to the pre trip and the items we previously mentioned, you should ensure that you have snow chains on the bus. As mentioned, weather can change drastically at higher elevations. You need to be prepared for anything when driving through those areas.

Basic Mountain Driving Skills

10) If you were to ask a typical motorist to get behind the wheel of a school bus, they would probably tell you “NO WAY.” If you were to ask them to drive down a roadway with only inches away from a cliffside, they would probably say “are you crazy?” The point is, driving a school bus down narrow, curvy roadways takes some practice and definitely a unique set of skills.

11) When driving through rural areas, communities and/or mountainous locations, you are going to see that things are set up a little differently. **That is why it is important to obey**

traffic signs and road markings. Especially if you haven't been in a particular area...these signs are going to be warning you, and **you should heed to those warnings.**

12) Many of the signs you will see are self explanatory: speed limits, curvy roadways, pedestrian crossing and deer crossings. **And some of these signs are going to be unique to the area. They are going to be warning you about:**

- a) extremely sharp turns.
- b) long, steep downgrades.
- c) vehicles in and out of the roadways.
- d) even possible tractor crossings.

13) When driving on rural or mountainous roadways, there are few things to keep in mind. One being that the **lighting is constantly changing at every turn.** You should make sure you are positioned to not only be able to see into all your mirrors clearly, but also that the sun does not obstruct your vision when coming out of a shady area into a lighted one.

14) **Steering techniques are extremely important** when driving on curvy and narrow roadways. Keep your hands in the proper position at all times and minimize taking them off the steering wheel. Windy roads like this can give you a workout and require your steering techniques to be on point.

15) When approaching a curve that requires you to slow down, **be sure to anticipate curves by obeying traffic signs.** Make sure to **ease off the throttle and hover over the brake pedal.** When you need to apply the brakes, **it should be smooth and gradual.** That is also why paying attention to road signs is so important. You don't want to have to slam on the brakes to make it around a curve safely. Instead, you want to anticipate and prepare for it ahead of time. By doing this, it will ensure a smoother ride for students on board and may also keep your mechanics in a good mood.

16) **Following distances are important in rural areas for many reasons:**

- a) A deer may run in front of the car you are following.
- b) The weather may cause slippery roads.
- c) There may be an accident around a blind bend.

17) There are several reasons to keep a safe following distance from the vehicles in front of you. **Be sure to leave plenty of space for you to have time to react. Be sure to increase following distances dependent of traffic and roadway conditions.**

18) Another thing to keep in mind is how important the mirrors become in areas like this. Even though you are paying attention to what is happening at the front of the bus, **you MUST be mindful of the rear of the bus and its tail swing around tight curves and corners.** This requires you to be totally aware at all times. Sometimes you will be driving on roadways so narrow that you literally are an inch away from a bad situation.

Driving up a grade

19) Driving a school bus up a grade presents many challenges. The reason for this is that school buses are extremely heavy. **It requires a lot of power for a school bus to make it up a steep grade.** Combine that with many twists and turns and you can see why uphill grades can be daunting when driving a school bus.

20) When climbing a grade, **always try to maintain constant speed and apply steady pressure to the accelerator.** Be prepared to shift into a lower gear if it becomes necessary to do so. By doing this it allows for higher engine RPM's which in turn applies more power to the drive wheels.

21) When approaching a sharp curve while climbing a hill, you don't have to necessarily use your brakes every time. **Sometimes you can just ease off the gas and let gravity slow the bus.** This may save wear and tear on the brake pads and rotors. It also allows you to make the turn smoothly. If you do need to brake, once again, do it as smoothly as possible.

22) **You should slightly slow down when you're about to breach the crest of a hill.** If you are charging over the crest of the hill you may encounter a slow moving vehicle. Make sure you approach it slowly and stay alert.

23) **Something else you can do when coming around blind curves is to honk your horn when you are about to turn through it.** This will help to alert drivers who are traveling in the opposite direction.

24) When driving on a steep grade, remember that the bus is heavy and may be holding up traffic. **Be sure to watch for turnouts and allow following motorists to pass whenever given the opportunity to do so on an uphill grade.**

25) You should be constantly monitoring your water temperature gauge to be sure the bus is in the safe zone and not overheating. **If the bus does start to overheat, pull over to a safe location, call dispatch and alert them of the situation.**

Driving Down a Grade

26) When descending a hill in a school bus, there are several issues to keep in mind. **Just like gravity works for slowing a bus uphill, the opposite applies when traveling downhill.** With school buses being so heavy, slowing them requires forethought, technique and awareness. It isn't as simple as going down a steep grade and braking the whole time. That would be a recipe for overheating your brakes or even worse, a possibility of brake failure.

27) So, if you don't brake all the way down the grade, how will you slow the bus? School bus mechanics will preach it again and again. **LET THE TRANSMISSION AND RETARDERS do most of the work!**

28) When you overuse the brakes on the school bus, they can easily become damaged. Not only that, but excessive braking can be avoided by using additional resources that the bus provides to slow it down on steep grades.

29) A retarder is one of the resources that many school buses offer. A retarder is a system that slows the bus and maintains a safe speed by using engine compression. If used correctly in conjunction with the transmission, you can travel down steep grades with limited use of the brakes.

30) Remember to pay attention to traffic signs when approaching a downhill grade. You can take the appropriate steps by observing them. And as previously mentioned, when traveling down a grade, you want the transmission and retarder to do most of the work.

31) **At the crest of the hill and right before descending, you should place the bus in the appropriate gear and engage the retarder** to be ready to further reduce speed if it becomes necessary. You would click down on the retarder to help reduce the bus's downhill speed.

32) If speed needs to be slowed even further, the retarder can be clicked down again. The grade can be taken slowly and cautiously. **Monitoring speed and RPM's are critical.** You don't want to put too much stress on the engine by letting the RPM's get too high.

33) DO NOT let following motorists dictate your speed. Just because the people behind you are in a hurry, it does not justify for speeding up or breaking your target speed and jeopardizing safety. The following motorists can wait and they can pass you at a turnout or passing lane.

34) In the video, Bill explains how Duane targeted his speed correctly by using the transmission

and retarders properly. And by the time they reach the bottom of the hill, Duane only needed to apply his brakes once. And that was in preparation for a fairly sharp turn. This shows how using the transmission and retarder can reduce the chance of brake fade or failure on downgrades.

35) In the event of a worse case scenario situation such as the brakes beginning to overheat or even fail entirely, you will have to do all you can to slow and stop the bus. If this means driving it into a ditch or the side of a hill, then that is what you will have to do. Many steep and long grades have runaway truck ramps to stop or slow a big vehicle with potential brake loss. However, if one is not present, you would need to make the decision to minimize injuries by driving it into a ditch or hillside as previously mentioned.

Rural Driving Tips and Practices

36) You should not attempt to pass vehicles on narrow roadways or steep grades. The school bus is too big and heavy of a vehicle to make those types of maneuvers. If you do happen to need to pass a vehicle such as a large truck, do so with caution and be sure you will have plenty of space to complete the maneuver successfully.

37) Anytime you are traveling on mountainous roads and you have several cars behind you, be sure to pull off to let them pass. In many states, the law is 5 or more following vehicles. However, consideration to other motorists never hurts. Also, **make sure that the area you're pulling off to is safe and will allow you to easily get back on the roadway.**

38) If you do encounter a problem with the bus, or the 2-way radio is not getting reception, you can use your cell phone. **Never use cell phones while operating the bus.** Instead, pull over to a safe location off the roadway to make your call.

39) Something to be mindful of in these areas is animal life. Deer, turkey, dogs and even bears make an occasional showing on roadways in forested areas. You have to always be aware of your surroundings. **Be alert that at anytime an animal may run in front of the bus and you should be ready to react.**

40) You also need to understand that sometimes small communities, neighborhoods and schools seem to pop up out of nowhere. Be mindful of pedestrians in these areas. These can include: Students, Shoppers, Hikers, bikers, rafters and more.

41) Road construction is something else to watch out for. Whether crews are trimming trees, fixing power lines or sealing roadways, you need to be mindful of construction crews when driving down windy roadways. **Watch for warning signs.** They usually give plenty of

preparation time. And be ready to adjust your downhill speed when necessary.

42) Throughout the video, we covered several issues pertaining to driving the school bus in mountainous locations. We have gone over the steps that should be followed when climbing and descending steep grades. In addition, we have provided information that can be utilized to reduce the chance of brake issues by using the mechanical tools that the school bus provides. We also went over the importance of: Preparation, the pre trip inspection and driving techniques when operating the bus on windy roadways. Now, take this information and apply it. Whether it is on your daily route, a field trip or a sporting event....understanding how to drive safely in these areas is critical.

TEST QUESTIONS

1) Mountains can create their own weather systems.

TRUE or FALSE

2) It is okay to bypass some of the pre trip inspection as long as you check the tires and brakes.

TRUE or FALSE

3) Road signs are extremely important to follow when driving in hilly areas.

TRUE or FALSE

4) When you approach a curve that requires you to brake, make sure you wait until you get to the turn, then brake aggressively. This saves wear and tear on the brakes.

TRUE or FALSE

5) Sometimes when traveling up a grade, you can slow the bus by easing off the accelerator.

TRUE or FALSE

6) You should safely use turnouts to let following motorists pass on uphill grades.

TRUE or FALSE

7) The only thing you need to prepare for driving in the mountains is to wear warm clothes.

TRUE or FALSE

8) Black ice can appear in the spring time months.

TRUE or FALSE

9) When about to reach the crest of a long downhill grade you should:

a) observe road signs to prepare for the grade

b) Place the bus into the appropriate gear

c) engage the retarders

d) None of the above

e) All of the above

10) When traveling on a steep uphill grade, you would leave the bus in its normal drive gear.

TRUE or FALSE

ANSWER KEY

- 1) TRUE**
- 2) FALSE**
- 3) TRUE**
- 4) FALSE**
- 5) TRUE**
- 6) TRUE**
- 7) FALSE**
- 8) TRUE**
- 9) e. All of the above**
- 10) FALSE**