

Everything Mirrors on the School Bus

(Vision Exercises, Blind Spots and More)

Reference Guide and Test

Introduction

One of the primary requirements of a school bus driver is to deal with many issues simultaneously. One of the most important issues for bus drivers to understand is how the component parts of a school bus function. And, one of the most important components on a school bus is its mirrors. Mirror usage and the adjustment of mirrors on the school bus is a critical issue for school bus drivers. There are several factors that must be considered when adjusting and using the mirrors on the school bus and these issues will be covered in this program.

The video is designed to show drivers practices and techniques that can be utilized to help understand each mirror system on the bus, as well as the characteristics and zones that each mirror covers. The video is divided into 3 sections.

Part 1: Mirror Basics and Their Zones

Part 2: Mirror Vision Exercises

Part 3: Recognizing Blinds Spots and More

MIRROR BASICS AND THEIR ZONES

1) To safely operate a school bus, drivers have to make accurate decisions based upon what they can see. The view through the windshield lets the driver know what's ahead, but the view to the sides and rear of the bus are limited to what information is provided when looking into the mirrors.

2) **In order to see into the mirrors, they must be kept clean.** If mirrors are not kept clean, even the best positioning and adjustment won't matter. A mirror with dirt, debris, condensation, frost or ice on it can obstruct a driver's view. Dirty mirrors may even throw your perception off when trying to gauge vehicles around the bus. Make sure mirrors are always kept clean. You should be able to look into your mirror without having to "search". You should carry labeled glass cleaner and paper towels with you in case the mirrors need to be cleaned when on route.

3) **There are several types of mirror configurations for each bus.** You should take the time to practice and adjust the mirrors on the bus you drive. However, new buses with new mirror configurations are being produced regularly and you have to get used to those different types of mirror configurations as well.

4) **Every mirror on the bus has a specific job.** All of the mirrors needs to work together; this means they must be in tune with each other to insure their complete accuracy. In other words, mirrors are most accurate when they are used in conjunction with one another.

5) There are **two side-mounted flat mirrors**, one on the right side of the bus and one on the drivers side. They are used to monitor traffic, check clearances and identify students on the sides and to the rear of the bus. Keep in mind that the flat mirrors on most buses do not provide enough visual information by themselves to allow safe driving decisions.

6) **Convex mirrors** are there to help aid the flat mirrors. Convex mirrors are typically mounted on the left and ride sides of the bus. They are usually located just below the flat mirror. A certain amount of distortion occurs when looking into the convex mirrors. However, the benefit of the convex mirror is that it allows the driver to see a wider field of view.

7) **Cross-view mirrors** are typically located at the very front of the bus. They are there for the driver to view the front area of the bus. Keep in mind that small children, in particular, can go unseen when passing in front of the bus. The cross-view mirror, with its extreme wide angle field of view, has the ability to pick up these difficult to see students.

8) The on board **student mirror** allows the driver to keep an eye on students that may be misbehaving or creating disturbances. Another benefit is that students are aware that the bus driver can monitor their behavior, so they are less likely to cause issues when they realize the driver can see what they are doing. This mirror also allows the driver to make sure students stay seated until the bus comes to a complete stop.

Mirror Zones

9) The **left and right side flat mirrors** should have a viewing range up to 200 feet or 4 bus lengths behind the bus, as well as along the sides of the bus. Drivers should be aware that there is a blind spot immediately below and in front of each mirror, and directly in back of the rear bumper. The blind spot behind the bus can extend up to 400 feet depending on the length and width of the bus.

10) The **convex mirrors** are used to monitor the left and right sides of the bus at a **wider**

angle than that of the flat mirrors. These mirrors are often used in conjunction with the flat mirrors to obtain the optimum visibility. It is important to understand that these mirrors distort people and objects and do not accurately reflect their size.

11) The outside **left and right cross-view mirrors** are used to view the front bumper and to view the danger zone areas located at the front of the bus. This includes the bumper and the area where the service door and front wheels are located. These mirrors also present a view of people that does not accurately reflect their size and distance from the bus.

12) The **student mirror** is mounted directly above the windshield on the driver's side area of the bus. It is used to monitor passenger activity inside the bus. *It will provide almost no visibility out the rear of the bus*, which as mentioned, is a blind spot that can extend up to 400 feet or more. You must use the exterior side mirrors to monitor traffic that approaches and enters this area.

13) It is important that you thoroughly understand zones that each mirror covers so you can maximize your viewing capacity.

MIRROR VISION EXERCISES

1) The **mirror vision field** test is a federally mandated program that was started in 1993 and was developed to describe accurately the characteristics of the mirror systems on the school bus. In addition, it demonstrates how to recognize blind spots caused by the mirrors. The mirror vision field test has a very practical purpose. It's designed to help the school bus driver visualize the effectiveness and limitations of the mirror system. By using color coated cones the driver will be able to visually identify what they should be able to see in a mirror that is correctly adjusted.

2) In the video, we show a variety of cones positioned around the bus. Each of these cones represent the exact distance in which they are placed. The following will be a breakdown of the positioning of the cones.

3) At the **front of the bus**, there are:

- a) 3 red cones placed a foot from the front bumper
- b) 3 white cones placed 6 feet from the front bumper
- c) 3 blue cones placed 12 feet from the front bumper

4) On the **driver's side of the bus**, there is:

- a) 1 red cone placed a foot from the front tire
- b) 1 red cone placed a foot from the rear tire
- c) A green cone that is placed 6 feet from the rear tire
- d) 1 yellow cone that is placed 12 feet from the rear tire
- e) 1 red cone placed 200 feet to the rear of the bus

5) On the **right side of the bus**, there is:

- a) 1 red cone that is placed a foot from the front tire
- b) 1 red cone that is placed a foot from the rear tire
- c) 1 yellow cone that is placed 12 feet from the rear tire
- d) 1 red cone placed 200 feet to the rear of the bus

6) There are 2 mirror systems that create the mirror vision test. System A and System B. System A will cover the flat mirrors on the bus. And system B will cover the convex mirrors.

System A (Flat Mirrors)

7) In the video, a trainee is sitting in the driver's seat when asked if he can recognize certain cones in the flat mirror. **With system A**, the flat mirrors should be able to pick up the red cones that are placed a foot from the rear tires on both sides. They should also be able to pick up the red cones that are placed 200 feet to the rear on each side of the bus. In the video, the trainee was able to identify all the cones that were just mentioned. This means mirror adjustments for system A is accurate.

System B

8) **System B** is extremely important because it should pick up all of the additional cones that the flat mirror could not. In the video, the trainee is able to identify all cones at the rear of the bus by looking into his convex mirror. These additional cones (green and yellow) would not be possible to pick up if only using the flat mirror.

9) The cones at the front of the bus can all be picked up by the cross-view mirrors as shown in the video. The bottom line is that the trainee was able to identify the additional cones using system B. It would not have been possible to identify these same cones using system A. This means that mirror adjustments on the bus are accurate due to picking up all the cones using both mirror systems.

RECOGNIZING BLIND SPOTS AND MORE

1) In conjunction with the mirror vision test, there is another exercise that can be used. This test will show the areas that can be seen in the mirrors as well as the blind spots that are caused by the physical dimensions of the mirrors. The instructor in the video uses ropes that are tied to the bottom of the flat mirrors' brackets.

2) With this exercise, the trainee is instructed to first look into the right flat mirror, as the instructor walks out of view, and honk the horn when he can no longer see the rope in the flat mirror. In the video, you can notice that a "V" has been formed by the two ropes. The inside of this "V" approximates the area that the driver will be seeing when looking into the right flat mirror.

3) Next, the same thing is repeated for coverage of the convex mirror. In the video, you can really notice that this area is considerably larger. This area represents the **additional** coverage that the convex mirror provides. This practice should be done on both sides of the bus. This simply helps the bus driver recognize the areas of coverage from another perspective.

4) The instructor in the video makes a very important point to the trainee. He reminds the trainee that when in traffic, it will require the use of both flat and convex mirrors to accurately switch lanes.

Blind Spots Caused by the Mirrors

5) **Blind spots** are caused when the mirrors obstruct the driver from seeing what is behind the mirrors. Once again you can use ropes to recognize where the blind spots are located. In the example provided in the video you can see: the instructor appear from behind the mirror and you will also notice that the instructor sets the rope down on the ground, so the

driver can see when the instructor appears from behind the mirror. This is done from both sides of the mirror. You can understand this blind area by noticing the "V" shape that is formed. Anything inside the "V" shape (which is a shaded area in the video) is a blind spot for the driver. And anything outside of it can either be picked up by looking outside of the bus, or by using the other mirrors. This practice should also be done on both sides of the bus.

6) The instructor then brings up another good point. He informs the trainee that when making a turn or switching lanes, the **blind spots caused by the mirrors follows right along with you.** When you are looking into the mirrors, while making a turn or simply driving, you must keep in mind that the blind spots the mirrors create are constantly changing. They do not remain static.

7) In the video, we give the example of moving your body to see beyond blind spots caused by the mirrors. This is called the **"rock and roll method."** It can be used to help in identifying students and vehicles that appear suddenly behind the mirrors blind spots.

8) It is equally important to know that every time you make a seat adjustment, you will have to re adjust your mirrors. Remember that your personal field of view changes **when you move your seat. You should adjust the mirrors accordingly.**

CLOSING

You should take the time to apply these mirror tests. This will help you to get a better visual understanding about what you can and cannot see in the mirrors. It will also help you understand where the blind spots are located.

In the video, we covered several issues pertaining to the mirror systems on the school bus. We have covered the importance of keeping your mirrors clean and understanding that there are several different types of mirror configurations. We also thoroughly went over the different types of mirrors on the school bus and clearly demonstrated the zones they cover. We have also gone over the mirror vision field test to give bus drivers an understanding of the coverage of each mirror system. We have demonstrated in detail the importance of recognizing blind spots. Now it is up to you, to take this knowledge and apply it.

Knowing the zones and their effectiveness could be the difference between a typical bus ride, or a bus ride that has the potential to cause a serious accident. We applaud your effort. And we applaud the hard work and training that you put into your job.

TEST QUESTIONS

1) A dirty mirror is just as bad as a mirror that is out of adjustment.

TRUE or FALSE

2) It is unimportant to know the types of mirror configurations since they are all supposed to see the same thing anyway.

TRUE or FALSE

3) Flat mirrors are able to pick up any objects that are 400 feet to the rear of the bus.

TRUE or FALSE

4) Flat mirrors are the best mirrors to use to obtain the widest possible angle to the side of the bus.

TRUE or FALSE

5) The two mirrors that can distort people and objects when looking into them are:

- a) **the flat and convex mirrors**
- b) **the convex mirror only**
- c) **the convex and cross-view mirrors**
- d) **the cross-view mirror only**
- e) **none of the above**

6) The cross-view mirrors are designed to see the front bumper and to view the danger zone areas

TRUE or FALSE

7) The student mirror is the most effective mirror to use when looking out the back.

TRUE or FALSE

8) A good practice to help recognize blind spots on the school bus is to:

- a) **yell at someone when they are in the blind spot**
- b) **set cones in the blind spot**
- c) **use ropes and honk the horn to help identify the blind spot**

9) The mirror vision test is a federally mandated program. Its main function is to acquaint drivers with the limitations of flat mirrors.

TRUE or FALSE

10) Knowing what you should see in the mirrors and their zones is mostly guess work that each driver can interpret in their own way.

TRUE or FALSE

ANSWER KEY

- 1) TRUE
- 2) FALSE
- 3) FALSE
- 4) FALSE
- 5) c
- 6) TRUE
- 7) FALSE
- 8) c
- 9) FALSE
- 10) FALSE