

The following article appeared in the February 2007 edition of Christian School Products magazine.

5, 4, 3, 2, 1 the buzzer sounds just as two points are added to the scoreboard, spectators erupt in cheer for the home team. Hundreds of hours of practice and physical conditioning went into the team and when the final buzzer sounded it was all worth it. Watching our kids play sports is great; children working together, learning the importance of good sportsmanship, and doing all of this in a safe environment; right?

Gymnasium safety

Gymnasiums are a safe place

Of course the gym is a safe place; floors are regularly cleaned and inspected for damage, bleachers are lubricated and seats are tightened, electrical and plumbing systems are subject to strict codes. But what about the stuff hanging over your head? Too often, basketball backstops are the most overlooked piece of equipment. Of course, manufacturers design and build backstop systems that are safe and reliable, but the majority of existing units lack a fully automatic safety strap and aren't regularly inspected.

What happens if they fall?

When you turn the key to lower or raise your basketball backstops, do you ever think about what would happen if suddenly a cable snapped? For some backstops, it might not be a question of if, but when.

Many athletic directors and staff who operate basketball goals are quite weary of the size of these units and do keep an open ear and a close eye on the unit when raising or lowering them. The movable portion of a backstop system can weigh close to 1000 lbs., and can be suspended 20- to 30-feet above the court floor. Together, when these systems fall, they can generate thousands of pounds of force on impact. It usually damages the backstop structure and facility. More importantly, it can also cause injury to people below. The type of damage that occurs when this happens can include pipes damaging ceilings and walls, damaged gym floors and bleachers, even fractured ceiling beams. In figure 1, you can see the results of a failure and fall of a backstop structure. In this case a pulley failed and started a chain reaction sending this goal on a 30-foot free fall. This goal fell from a stored position striking the jogging track bending the main beam of the backstop backwards to a 30-degree angle. The jogging track took the impact, sparing the wall but severely damaged much of the backstop structure.

In another case, the damage was much worse. At a major university a student was paralyzed when a backboard struck him as he was sitting in the bleachers. The moral in all of these examples is that the cost of any damage and the liability is far greater than the cost to install a safety strap and to provide regular maintenance and inspections.

Why do backstops fall?

I spoke to an equipment installer who was sitting in the bleachers at a high school basketball game and noticed that most of the bolts holding a backstop structure had been removed and the unit was held up by a couple loose bolts. In this case the game was postponed for some time so the installer could reattach the unit properly. In another case there was a pulley that had been cut in half from cable wear and when the wire could no longer travel through the pulley it snapped sending the backboard on a 35-foot freefall striking the gymnasium wall.

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There are times when there are no loose or worn components but there are limit switches not functioning properly. The limit switch is pre-set and determines the distance a backstop can travel up or down before the power shuts off to the winch. When the limit switch is not set properly or fails to perform its' function the winch could pull the backstop past its' set travel distance putting intense pressure on the entire system stressing supporting hardware and possibly causing a system failure. Pulleys, cables, worn components, limit switches and many other factors can contribute to failure of a suspended backstop.

You can prevent falls

Most systems are custom built at a state of the art factory shipped as a kit to a job site and are then reassembled and installed in the gym ceiling. Manufacturers of suspended basketball equipment are very safety conscious and build safe and reliable structures, once the system is properly installed it is the schools responsibility to inspect and maintain that equipment. The one item you should have even if you inspect and maintain your suspended equipment regularly is a fully automatic safety strap. This piece of equipment acts as a backup so that if the cable ever failed the safety strap acts like the seat belt in your car and stops the backboard from falling. Many older safety systems were not automatic and pinched the belt when triggered requiring a manual reset of the unit. Striking the belt of an older system with a ball could trigger some of these systems leaving the basket stuck in mid air. After having to travel 30 feet high to reset the unit a few times many were just removed from the backstop and tied off to avoid having to reset them. Today safety straps are fully enclosed and work silently in the background and do not need to be reset if actuated. There is no good reason for any movable backstop to not have a safety strap installed.

Can you prevent equipment failures?

Accidents happen sometimes besides our best efforts to prevent them. Having a proper safety system installed will provide a greater level of safety and if you do not already have a preventative maintenance plan for your basketball backstops I suggest you plan one now. If you do not have the resources or expertise to perform an initial inspection or to provide preventative maintenance there are qualified equipment installers who can provide this service for you locally. If you plan to perform this yourself here are some suggestions for inspection and maintenance of your equipment.

- Install a safety strap or inspect your existing safety strap belt for any sign of wear and perform a pull test to test the units function
- Inspect and tighten bolts where needed
- Check all moving parts for signs of wear and replace as needed
- Lubricate moving parts where required
- Replace winch cable every two years or immediately if there is any visible wear
- Inspect and adjust limit switches

By following some of these general guidelines for better backstop safety, the next game in your gymnasium can be a safe and enjoyable experience for all involved.

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