

## Workplace Safety: Backup Alarms

According to the Bureau of Labor Statistics, fatalities due to being struck by a vehicle accounted for 6% (397 deaths) of all fatalities for the construction industry in 2002. These deaths are highly preventable using the proper safety procedures and equipment. Effective vehicle backing safety is an integral part of construction site safety. Two important parts of vehicle safety are operator safety and ground worker awareness. To avoid struck by vehicle fatalities both the operator of the vehicle and the ground workers need to be aware of the others presence. An important tool in ground worker awareness is a backup alarm. The OSHA standards for motor vehicles as they pertain to vehicle backing are as follows:

- 1926.601 (b) (4) No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:
- The vehicle has a reverse signal alarm audible above the surrounding noise level or:
  - The vehicle is backed up only when an observer signals that it is safe to do so.

EM 385-1-1 states; "Backup alarms shall be audible and sufficiently distinct to be heard above the surrounding noise level."

### **Benefits of using a Broadband backup alarm versus a tonal alarm:**

- ◆ Better source location identification. Broadband sound sources are more easily identified by the worker, reducing the chance of confusion regarding which vehicle is preparing to backup in busy construction sites.
- ◆ Hazard area sound localization. The broadband warning sound is audible in smaller location around the backing vehicle, helping to further reduce confusion, as well as minimizing noise pollution to surrounding areas.
- ◆ Audible through hearing protection. The broad range of frequencies used in broadband alarms allows for better penetration of hearing protection. Low frequency noise is most effective at penetrating hearing protection.
- ◆ Hearing loss friendly. Employees who already suffer from hearing loss may have a hard time hearing tonal alarms because they operate in a narrow frequency band. If the frequency of a tonal alarm coincides with the frequency of hearing loss the effectiveness is diminished. By using a broad range of frequencies broadband alarms are more easily heard by those with hearing loss.
- ◆ Lower decibels. The broadband sound is more easily recognized by the ear, and therefore can be effective at lower decibel levels.
- ◆ Health effects due to "startle". ISO-7731 states; "Reactions due to fright (e.g. more than 30dB in 0.5 seconds) may be caused by using too high a sound-pressure level." These can delay, or even prevent escape from danger due to "freezing".



### **Use of Broadband backup alarms:**

- ◆ All employees shall be notified of the implementation of broadband backup alarms. Employee awareness is an important part of improving safety.
- ◆ If broadband backup alarms are used, the self-adjusting type of broadband backup alarm is strongly recommended where ambient noise levels are likely to fluctuate.

**Vehicle accidents are highly preventable. The use of broadband backup alarms can improve employee awareness and minimize "struck by" vehicle accidents.**