

Crushing Hazards

The closing of an overhead door or powered gate creates a crushing hazard. This crushing hazard is very self-evident. This hazard is an inherent hazard and cannot be designed away – a powered closing door is always going to exhibit some sort of hazard. Engineering design principles call for the use of guarding to reduce the hazard of a closing overhead door. The hierarchy of design calls for neutralization of the hazard with fixed guards, automatic-stop device, or other protective safety devices. Today, there are a multitude of solutions to protecting against the crushing hazard of powered doors.



Solutions to Crushing Hazard

Contact Sensors

Solutions to the crushing hazard have been available for many years. The most basic system involves a contact sensor located along the bottom edge of the overhead door that is connected to the door operator that stops or reverses the down motion of the door. Manufacturers of residential powered garage doors have recognized the crushing hazard and compensated for it by using crush sensors along the bottom of the door along with additional safety measures.

Non-Contact Sensors/Optic Beams

Non-contact sensors are sensors that can detect a potential obstruction between the powered door and the ground or other fixed structure without making physical contact. This is desirable because it could stop the door travel or reverse the door travel before a collision occurred. Most non-contact sensor used on overhead doors and powered gates are invisible optic beams that stop or reverse the door when the optic beam is broken. Multiple optic beams should be used to prevent them from being bypassed by people in a hurry – how many times have you seen people hit the door close button, and dash out of the closing garage, jumping over the perceived location of the optic beam? Multiple optic beams could prevent this type of extremely hazardous behavior. To account for the human factors of the situation, door manufacturers could provide an enclosure for the optic sensors that would prevent onlookers from being able to determine the location of the optic beams.



While optic beams do help safeguard the crushing hazard of powered doors, a more reliable non-contact sensor system would be able to detect obstacles at any point in the door's travel. This would involve putting the optic sensors in the edge of the door itself, which presents design challenges including the fact that energy absorption would have to be built into the optic sensor on the door edge to prevent destruction of the sensor after multiple opening and closing cycles.