

Inspection Protocol for Garage Doors

Watch out for the last few inches!

There is considerable controversy regarding the proper protocol to evaluate a modern roll up garage door and its safety devices. Inspectors have various ways of disclosing the condition of the door and operator; but there is little consistency in the inspection industry. In my opinion it is important that every home inspector should be aware of all the potential benefits as well as the risks associated with any inspection so that an informed business decision can be made whether or not to include that system in their inspection report, and if that system is included, how much detail to include in the report. This is a business decision that every inspector must make of his own accord. The following is the inspection protocol I use when inspecting a garage door. Since there are many different garage door systems available; my comments are restricted to the typical roll up metal door with a ceiling mounted operator.

According to the Standards of Practice, the inspector is not required to operate the garage door's safety devices but we are required to visually inspect the garage door for defects. We are required to include the basic operation, much the same as we would turn on the HVAC unit but we are not required to push the operator button as stated in the limitations. I suspect a case can be made that they are required to inspect the manual portion of the door as they are part of the ordinary user operation, i.e. "the readily accessible systems and components" as stated in section II. The B&P 7195 requires inspecting "essential components." But, is the garage door an essential component and can our standards supersede state law? There may be some conflict between the B&P code and our Standards of Practice. The law may require pushing the operator button, pulling the emergency rope and checking the manual operation of the door. How and what to inspect, and how the standards and the law are included in the inspection report are ultimately business decisions that must be made by the inspector.

B&P Code 7195. For purposes of this chapter, the following definitions apply:

(a) "Home inspection" is a noninvasive, physical examination, performed for a fee in connection with a transfer, as defined in subdivision (e), of real property, of the mechanical, electrical, or plumbing systems or the structural and essential components of a residential dwelling of one to four units designed to identify material defects in those systems, structures and components. "Home inspection" also includes any consultation regarding the property that is represented to be a home inspection or any confusingly similar term.

Start Outside

The inspection is divided into two sections: the interior, and the exterior. First, close the garage door to inspect exterior portions. Check the door for any impact damage at the door panels. Are there any cracked or discolored windows in the panels? Check for car impact damage at the lower portion of the door jambs. Many times a car has pushed the jambs out of plumb and split out the bottom plates. Look at the brick veneer next to the jambs for indications of being knocked loose from the wall. This is especially important for older detached garages that may be missing the diagonal bracing inside the walls. Many times these structures are leaning over either side to side or front to back. This condition can usually be seen by lining up the jamb on the door. Some inspectors carry a torpedo level to check these types of issues. Keep in mind that using a level is outside the scope of a visual inspection and that it should be used discretely, if at all.

Stand back and check to see if the garage door header is sagging. Many times when a hip roof lands on an older header, the header will sag. This can be readily seen by lining up the header on the straight lines on the door. Check the condition of the trim at the garage door jambs and the condition of the paint and caulking. Are there any scuff marks on the trim indicating the door is rubbing in these areas? Many times scuffing on the top panel is a clue that the header has sagged. Is there any water damage at the base of the garage doorjambs? These conditions may be reportable in another section of the report but this is a good time to observe all of the conditions as all the systems are interrelated. Is there a key pad present for operating the opener? Is the key pad 60" high for child safety? If a key pad is present, include a prompt in the report for the client to ask the seller for the codes.



Sagging header on older garage



Built in depressions in the garage floor will help keep water out of the garage.

Check the concrete to see if there are any indications of water standing or running under the door into the garage. There should be about a 1/2" rise from the driveway to the garage floor to keep water out of the garage but not always. Sometimes a conscientious builder will design the concrete in this area so that the door closes in front of the raised lip thereby providing a clean appearance and allow for all the water running down the door to be drained to the exterior rather than pooling on the garage floor. Again, this is reportable in another section but this is a good time to observe for any possible conditions.

After completing the exterior inspection, go into the garage, but **do not open the garage door yet!** Carefully check the tracks to insure there are not any dead bolts or homeowner installed screwdrivers, wrenches, and/or mops inserted through the tracks to prevent unauthorized opening of the door. If you attempt to automatically open the door and the door is locked, then there is a high probability of damaging the door. Open a locked door one time and you will never again forget to check for locked garage doors.



A pad lock in the garage door track can cause the door to fall off the tracks

While you are checking the garage door for locks be sure to look at the condition of the hardware on the door. Are there any bent or damaged struts? Is there corrosion at the bottom of the door? Are any of the rollers missing? Are all the bolts present and tight? Be sure to carefully check the operator arm. This area is subject to homeowner repairs and can cause trouble for any subsequent safety device evaluations of the door.

Has the tracks been smeared with grease? Greased tracks are a homeowner repair which is not recommended by the typical manufacturer. Grease on the tracks will stop the rollers from rolling in the track and will create flat spots on the wheels as they slide over the tracks. Over time this condition will eventually require replacement of at least some of the parts. Greased tracks usually indicate an underlying condition that has not properly been resolved, but only covered up.

Next, look at the portion of the garage ceiling that is blocked by the door when it is in the open position. It is easy to miss ceiling conditions that are blocked by the opened door. Is there any water staining or damage to the ceiling? Is there an access opening into the attic? Is the access fire rated? I always advise my clients that if you place a ladder up to the access while the door is closed there is the possibility of a person being knocked off the ladder when the door is opened by remote control from the outside, or even by a child playing with the operator button. I recommend that some type of dead man switch be installed at the access that inactivates the operator to protect the person standing on the ladder. I had a dear friend of mine sustain significant head injuries from being knocked off a ladder when a roll up door was opened from the outside. He was put on permanent disability.



Leaning wall on detached garage

If the door is blocked by personal items or there is a car in the garage then the inspector must make a decision whether or not to proceed. Sometimes, if the owner is home, I will ask them to move the car; I am hesitant to ask them to move their personal items as it may upset the owner. My decision is directly proportional to the age of the door, the value of the car under the door and the evidence whether or not the door is regularly operated. If I am not comfortable with the situation then I recommend in the report that the area be cleared and reinspected. Be sure to include somewhere in your report that you are to be paid for any reinspections! Agents will test your business relationship and ask you to perform all sorts of services for free with the implied acknowledgment that it is a requirement for continued referrals. Whether or not you reinspect for free is a business decision but you should always try to keep the respect of the agents in order to prevent them from abusing your time. Always keep the option to be paid for your reinspection services. ***Do not confuse*** this service with inspecting a repaired system to confirm whether or not repairs were properly completed. This is a different business that exposes you to all the liabilities of the entire repair area. This falls under the heading of a General Contractor, not a Home Inspector.



A missing pull rope can be a safety hazard in an emergency condition and a major inconvenience when the power is out.

Once you are assured of being able to safely open the door, check the button. Is it tight on the wall or loose and hanging by the wires? Check the height of the operator button. The button should be 60” from the floor to keep children from reaching the button. On homes with steps or other unusual designs you should look for how a child may try to reach the button. When I measure, again using a measuring tape is outside the scope of a visual inspection and should be used discretely. I measure from the area where a child is likely to stand when trying to reach the button.

Now you can finally open the door. Push the button and observe the door as it opens. Be ready to quickly push the button to stop the door should the door bind or make unusual noises; being ready to stop the door quickly can save you from causing damage to the door. Listen to the door as it moves. Does it make loud noises? Does it pop and clatter? These could be reportable conditions.



Light sensor too high off the floor is a child safety hazard

Now that the door is open, check to see if the emergency rope is present. The emergency rope is necessary to operate the door during times the electricity is off or during emergency conditions, like a fire. Missing emergency ropes are an important safety hazard.

like a fire. Missing emergency ropes

Check the condition of the rubber gasket at the bottom of the door. Is it missing or badly deteriorated? What is the condition of the operator? Is it properly wired? There should not be any homeowner installed electric cords or romex (non-metallic sheathed cable) hard wired to the unit. Sometimes the operator is on a GFCI and will not operate when the GFCI is tripped. Usually it is not recommended to have a motor on a GFCI circuit. Try to determine the age of the operator. The older the operator the higher the probability of the unit failing under testing conditions. If the unit is suspect, then defer it to a specialist and stop the door inspection.

Is there a light sensor at the bottom of the door? If the light is missing then it is a safety hazard and the entire system should be referred to a specialist. This light sensor has been required since 1993. The light should be no more than 6" above the floor; I prefer 4". This light is designed to prevent the door from closing should something be in the way of the light sensor. Press the operator button and break the light beam with your foot. The door should automatically retract. If the door closes than the light sensor is defective. This is an automatic referral to a specialist. Keep in mind the sensor is not located directly under the door, but to the inside by a few inches. It is still possible for a child to become trapped under the door without breaking the light sensor beam.

Safety Commission Publishes Final Rules For Automatic Garage Door Openers

<http://www.cpsc.gov/cpsc/pub/prerel/prhtml93/93024.html>

WASHINGTON, DC -- In an effort to reduce the number of deaths to children who become entrapped under garage doors with automatic openers, the U.S. Consumer Product Safety Commission (CPSC) today issued final rules for automatic residential garage door openers. The rules, which will be published in the Federal Register, include revised entrapment protection requirements for all automatic residential garage door openers manufactured on or after January 1, 1993 for sale in the United States. The rules also include certification requirements and recordkeeping requirements for garage door opener manufacturers.

The entrapment protection requirements are part of a Congressional mandate in the Consumer Product Safety Improvement Act of 1990. The legislation requires that automatic residential garage door openers manufactured on or after January 1, 1991 conform to the entrapment protection requirements of the Underwriters Laboratories (UL) Standard for Safety, UL 325.

The legislation also requires that residential garage door openers manufactured on or after January 1, 1993 comply with additional entrapment protection requirements developed by UL.

The rules issued today specify these additional entrapment protection

requirements. The revised standard requires that residential garage door openers contain one of the following:

- External entrapment protection device, such as an "electric eye" which "sees" an object obstructing the door without having actual contact with the object. Another similar device would be a door edge sensor. The door edge sensor acts much like the door edge sensors on elevator doors.
- Constant contact control button which is a wall-mounted button requiring a person to hold in the control button continuously for the door to close completely. If the button is released before the door closes, the door would reverse and open to the highest position. The remote control transmitter will not close the door with this option.

I read about an incident a while ago where there were some children playing with a garage door. They would push the operator button and race to crawl under the light sensor before the door closed all the way. In this case the door was out of adjustment and caught one child as he crawled under the light sensor and was crushed to death. The height of the sensor should be no more than 6" high but I like to see it closer to 4" to stop this type of behavior. The light sensors are so easy to install and test there is very little reason not to have these important safety devices properly installed.



From the DAMSA web site

The law that requires a light sensor also includes labeling the door with the appropriate safety information. I am hesitant to call out missing labels but it is part of the law and every inspector should be aware of the requirements.

TITLE 16--COMMERCIAL PRACTICES

CHAPTER II--CONSUMER PRODUCT SAFETY

COMMISSION PART 1211--SAFETY STANDARD FOR AUTOMATIC RESIDENTIAL GARAGE DOOR

http://www.access.gpo.gov/nara/cfr/waisidx_04/16cfr1211_04.html

OPERATORS--Table of Contents

Subpart A--The Standard

Sec. 1211.15 Field-installed labels.

(c) A residential garage door operator shall be provided with a cautionary label intended for permanent installation to identify the possible risk of entrapment. The instruction manual shall direct

that the label be affixed near the wall-mounted control button.

(i) ``Test Door Operator Monthly: **Use a 1\1/2** inch thick object placed on the floor under the closing door. In the event the door does not reverse upon contact, adjust, repair, or replace the operator.''

Next, push the operator button and close the door about half way. Pull the safety rope and see if the door tries to close on its own. The door should stay in position and not fall closed. Consider the implications of the door falling closed on a child. If the door is not properly adjusted then it is a safety hazard and should be referred to a specialist. The reason for partially closing the door is the difficulty in reengaging the safety latch should the position of the chain is slightly out of adjustment. It can be difficult to reengage the latch and time consuming if the door is not adjusted correctly. By partly closing the door first, this issue is bypassed.

Many years ago, I had a very experienced concrete foreman (rough as a cob) who for whatever reason got his finger stuck between the panels of the garage door on our storage shed. Apparent, instead of using the “T” latch to close the door he reached up and grabbed the open crack between the hinges on the upper panel. The door closed, latched and **locked** with his finger smashed between the panels. He was trapped in this position for quite some time (nobody knows for sure how long) before he was discovered by his crew. I never did find out exactly what happened but his finger was smashed flat as though hit with a heavy framing hammer. The tell tale bumps in the door panels were a source of laughter for the rest of the crew for years afterward but never in front of the foreman *for fear of significant personal injury*. The moral is never put your fingers in the hinges of a garage door.

Business and Profession Code 7195.

For purposes of this chapter, the following definitions apply:

<http://www.leginfo.ca.gov/cgi-bin/displaycode?section=bpc&group=07001-08000&file=7195-7199>

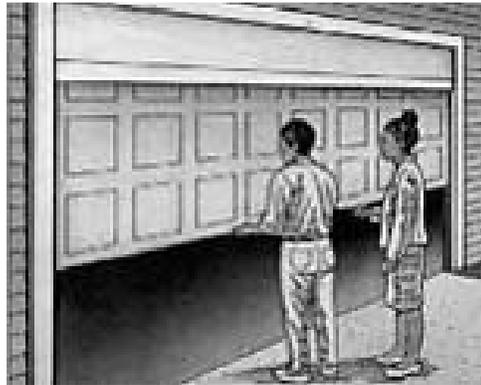
(b) A “material defect” is a condition that significantly affects the value, desirability, habitability, or **safety** of the dwelling. Style or aesthetics shall not be considered in determining whether a system, structure, or component is defective.

There is considerable confusion between the force setting test and the reversal test. Many years ago I was performing a walk through inspection with a client. When we reached the garage I was explaining about the auto reverse mechanism in the garage door operator. The homeowner overheard our conversation and placed a 2x4 under the door just slightly off center of the center support strut. The homeowner hit the button and we all watched the door close. I explained that the door should reverse when the door “contacts” the 2x4 and open. The door did not open when it “contacted” the 2x4 but instead crushed over the 2x4 and stayed closed. Any child caught under the door would almost certainly have been killed. It made quite an impression on my client and taught me an important lesson

never to use a 2x4 block under the door as a test. Needless to say the homeowner was upset but *he* placed the block and *he* pushed the button. Just about the time he was ready to blame someone his 6 year old son walked in and asked, “Daddy, what happened to the garage door?” This took all the will out his anger and he just stood there confused.

It should be noted that using a 2x4 block is not mentioned anywhere in the SAFETY STANDARD FOR AUTOMATIC RESIDENTIAL GARAGE DOOR, but it is mentioned in the Door and Access Systems Manufactures Association (DAMSA) web site. This may be due to the fact that most home owners are more likely to have a 2x4 rather than a 1x4 available for the monthly testing.

This happenstance has since occasioned me to review the design of the garage door to determine how one can reasonably test the downward pressure of the door. There are clear recommendations from the DAMSA garage door manufacturer’s web site. <http://www.dasma.com> They have the “Force Setting Test” where a person grasps the closing door when half way closed and estimates the pressure that it takes to cause the operator to reverse. It then goes on to recommend using a 2x4 block under the door to test the *auto reverse* mechanism in the operator. The door should auto reverse when it contacts the 2x4 block. The term “contact” is vague and subject to interpretation. This is the “Reversal Test.” Contact in this context suggests that when the door *just touches* the 2x4 it should reverse but there is no way to know if the door reverses on just barely touching the 2x4 or when it has squashed the block so hard that water runs out the end grains.



From the DAMSA web site

The auto reverse feature is based on the revolutions per minute of the operator motor. When the unit senses the revolutions of the motor slowing down (drag) the unit will auto reverse. The mechanical advantage of the track system increases in the last few inches of travel, accordingly, the effective power of the motor is greatly increased and the auto reverse system is not as easily engaged in the last inches of travel. **It is important that the inspector understands that the downward pressure of the door is greatly increased in the last few inches from the floor. When you perform the force setting test it is important that the inspector be conservative in the estimation of the downward force!** If you cannot easily stop the door with your arms extended then the pressure is too great.

TITLE 16--COMMERCIAL PRACTICES
CHAPTER II--CONSUMER PRODUCT SAFETY COMMISSION
PART 1211--SAFETY STANDARD FOR AUTOMATIC RESIDENTIAL
GARAGE DOOR

http://a257.g.akamaitech.net/7/257/2422/12feb20041500/edocket.access.gpo.gov/cfr_2004/janqtr/16cfr1211.13.htm

Subpart A--The Standard

Sec. 1211.13 Inherent force activated secondary door sensors.

(a) Normal operation test. (1) A force activated door sensor of a door system installed according to the installation instructions shall actuate when the door applies a **15 pound (66.7 N) or less force in the down** or closing direction and when the door applies a **25 pound (111.2 N) or less force in the up or opening direction**. For a force activated door sensor intended to be used in an operator intended for use only on a sectional door, the force is to be applied by the door against the longitudinal edge of a **1 7/8 (47.6 mm) diameter cylinder** placed across the door so that the axis is perpendicular to the plane of the door. The weight of the door is to be equal to the maximum weight rating of the operator. (This standard indicates the 15 pound maximum at all heights, not just at 1-7/8" above the floor.)

To the causal observer this appears to be reasonable recommendation but upon careful reflection one must take into account of the mechanical advantage that is exerted on the door in the last few inches of closing. If you watch the arm that attaches the chain to the door; during almost all of the closing cycle the relative position of the arm does not change. Accordingly, there is a one to one leverage placed against the door by the operator. However, if you watch the door as the last panel moves into the closed position, the relative position of the arm changes and the mechanical advantage of the operator greatly increases. This phenomenon can be illustrated by closing a mis-adjusted door and pulling the emergency latch. Many times the latch will "pop" because it is under compression. This condition prevents the door from being re-engaged because the chain has moved too close to the end of the track. Sometimes this is only a 1/2" or so but it is still impossible to re-engage the latch. In order to re-engage the chain a considerable amount of force is necessary to force the door down, compressing the bottom gasket in order to allow the latch to slide forward on the chain and engage. Usually the operator must be partially opened to allow the safety latch to be re-engaged.

In order to demonstrate this phenomenon, I first checked my garage door with my hand about half way closed and intuitively *passed* the door as being safe (force test). I next placed my wife's bathroom scale on some saw horses under the bottom edge of the door. This would approximate the location of the downward force test recommended from DASMA. The pressure reached 29 pounds before the door auto reversed, well above the 15 pound recommendation. I then placed the scale on the concrete and again closed the door. The scale is about 1-1/2" thick and registered 129 pounds before it auto reversed! I raised the scale up about 4" and again closed the door. The pressure this time reached about 60 pounds before reversing. Clearly, the closing pressure greatly increases as the door approaches the last few inches of travel and my having intuitively passed the door was incorrect! If anyone questions these assertions, I dare you to place your fingers on top of the 2x4 block to see if the door reverses on contact, or only after squashing your fingers! The real question is, "How many pounds of down pressure is safe for children?"

Having carefully considered the question, I have come to realize that motor drag activated secondary door sensors are probably not the best system available to protect our children.

Is 15 pounds of downward pressure recommended at 1-7/8" from the floor or from the halfway closed position?

Is 15 pounds a reasonable number for child safety? I do not know. The important point here is that if a door were to trap a child the pressure would increase as the child is compressed, much like a snake's constriction.

If you do the math where 29 lbs pressure half way closed,
And 129 lbs is the pressure almost completely closed,
And if the recommended pressure at closed position is 15 lbs then:

$$\frac{29 \text{ lbs}}{129 \text{ lbs}} = \frac{x \text{ lbs}}{15 \text{ lbs}} \quad \text{Solve for } x$$

X = 3.3 pounds downward pressure at the halfway point of the door! This is probably too light to insure reliable operation of the operator. Accordingly, it may be difficult if not impossible to meet the 15 pound pressure at the floor recommendation for all but the best systems.

I still grasp the door about 48" off the floor to test the reversing system but I now have less confidence in the test. If the downward pressure is at all questionable I call out the door as being mis-adjusted. There are two reasons. First is for child safety, and second is to minimize any dents a mis-adjusted door would put on a client's car should the car be straddling the sensor lights and the door closed. The downward pressure should be the absolute **minimum** to close the door. Adjusting this safety feature is so easy that there is little reason for not having a properly adjusted garage door operator. If I could choose, I would pick an alternate type of safety system that could have a more positive testing method to protect my children.

In my opinion, a garage door can be a significant safety hazard and should not be arbitrarily excluded from an inspection without good reason. I feel that the operator's safety features should be evaluated if reasonably available to protect the occupant's children and to meet the intent of the B&P Code.

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