

# Overhead Garage Door Openers

## A Friction Clutch is NOT a Pedestrian Safety Device

By Michael Panish, Door & Gate Expert Witness

This article aims to debunk the myth that a garage door operator uses a friction clutch as a pedestrian safety device.

As an overhead garage door expert with over 40 years of experience working in the industry and providing over 25 years as a door expert witness, I often hear some self-proclaimed "experts" state that injuries are mainly due to improperly adjusted friction clutches.

This article will explain overhead garage door operators with friction clutches. It covers the purpose and importance of a friction clutch, and how to set up a garage door opener that includes one as part of the opener's drive train.

If you are reading this article, you might be involved in an active overhead garage door injury claim. You may have engaged an expert without specific experience in personal injury claims with overhead doors or you have been informed that safety devices for overhead garage doors include a properly tightened clutch mechanism. Although overhead doors require various types of safety devices to meet standard compliance, adjusting a friction clutch mechanism is not one of them.

I have authored many industry-accepted articles on various garage door and overhead door systems, available at [www.ConstructionWitness.com](http://www.ConstructionWitness.com). Visit my site for accurate and unbiased information on their operation, usage, and applicability to your overhead door case or claim.

### Function and Purpose of a Friction Clutch in a Garage Door Opener

All of the following information is supported by national product manufacturers that design and sell garage door openers of all kinds. Some of this article's information is documented in installation and owners' manuals provided with the garage door operators at purchase and are available online if you wish to download a copy for your reference. The content of this article is based upon real world usage, and the accepted garage door industry views of how an opener must operate and be maintained.

This article is authored by Mike Panish, a highly sought-after garage door expert witness regularly retained by door service providers and multinational corporations specializing in the manufacture and sale of overhead garage door systems and components.

Whether for the plaintiff or defense, his opinions are consistent and unbiased for every case. They are not altered to suit the needs of the entity employing his services. Any professional and competent expert opinion should be impartial and based on industry-recognized standards and practices, regardless of which side of the claim one is involved with.

Contrary to some misconceptions perpetuated by unqualified individuals posing as garage door experts, it is essential to clarify the primary function of a garage door opener/operator friction clutch. The main objective of this component is to prevent the motor from overheating in the event that the garage door becomes obstructed during its movement. This purpose is consistently documented in the manuals provided by various manufacturers. It is important to note that a friction clutch is not intended to serve as a pedestrian safety device; its sole function is to protect the motor of the opener/operator.

### Trolley and Jack Shaft Operators:

The most common type of automatic overhead door operator, primarily used in residential applications, is known as a trolley system. This device slides along a centrally positioned greased rail or track that is attached via a shuttle plate and driven using one of several methods. The trolley, when attached, can be

operated by a continuous screw, a tensioned rubber belt, or in older styles, cables or chains. At the opposite end of the shuttle plate, from where it engages the drive mechanism, there is a rigid arm that is configured to provide attachment to the top section of the overhead door. The door can be a single panel or sectional type and may utilize either torsion or tensioned springs that pivot or stretch to counteract the door's weight.

Many common residential garage door openers only utilize a voltage-controlled system to detect obstructions. These devices do not have a field-adjustable friction plate clutch as part of their design and rely upon a voltage threshold to cause the door operator to stop pulling or pushing the door they control. During installation, the installer conducts tests to set the force parameters of the operator. It should be noted that most residential door openers lack a mechanically adjustable friction clutch.

Some residential installations may also use a Jack Shaft operator, depending upon the garage door ceiling height and type of installed door tracks. When a Jack shaft opener is used, it is attached directly to the torsion spring rod. The rod is the horizontal device that utilizes a fixed bracket typically mounted in the center of the door opening, which attaches one end of a spring, or pair of springs. The torsion springs are then wound for correct door balance and then attached via a winding cone that holds the spring tension firmly to the torsion spring rod. This mechanical attachment transfers the spring tension through spools and a lift cable to the bottom of the door system which, when properly balanced smoothly lifts the door up and allows it to descend safely.

A properly balanced overhead door will remain neutrally balanced at the mid-height position of travel. A properly balanced door system tends to drift slightly upward when in the mid-height location but should not descend without applied force. Improperly balanced doors can prevent the door operator from functioning correctly, lead to premature wear of the drive motor or transmission components, and eventually cause operational failure. The door balance is unrelated to the motor operator's friction clutch adjustment in a properly functioning door system.

A properly adjusted friction clutch will allow the motor shaft to slip when the door cannot move due to an obstruction or weight imbalance. A clutch cannot be utilized to compensate for an improperly balanced door. The friction clutch is properly adjusted when the door operator can lift a correctly balanced door. It cannot overcome an imbalanced door condition in most installations. Overtightening of the friction clutch negates the function of that device and can lead to the motor burning out. An overtightened friction clutch cannot protect the electric motor of the operator.

All electrical motors are subject to overheating from continual use, or when their drive train is stuck in an unmoving condition. Electric motors are often equipped with a push button reset that pops when the motor is rotor locked or is over taxed in use.

A common example of the push button reset mechanism is found in most kitchen garbage disposals. When an obstruction prevents the disposal motor from rotating, an increase in temperature due to heat or overvoltage typically triggers the overload button. This action prevents the motor from overheating, thus avoiding potential damage or electrical fires. This is similar to a circuit breaker in an electrical service panel where there is a short circuit or wire overheating due to excess current draw.

Many types of garage door openers use similar reset buttons that trip when the motor experiences overvoltage or excessive heat from repeated use without rest. The main difference between a commercial door opener and a residential opener is the amount of duty cycles that the opener can withstand without overheating and stressing the operator components. The primary distinction between commercial installations and typical residential garage door systems lies in the measured and rated duty cycle of the operator. Additionally, many commercial installations feature more robust components than those found in residential systems. For example, a typical door opener at a single family residence may be rated for 10 to 12 cycles per hour. Commercial robust operators can be used continually and may operate in the 100's of cycles per hour mode, if needed.

### **Where the opener clutch comes into play:**

A friction clutch in an electric motor is engineered to enable the shaft to slip, thereby preventing the motor from reaching a state of "rotor lock." This device is routinely incorporated into many electric motor transmissions commonly used in industrial metal or woodworking machines. Garage door operator manufacturers use a friction clutch mechanism to protect their electric motors when something obstructs the path of an attached overhead garage door.

**A friction clutch is not, nor has it ever been, a safety device designed to protect pedestrians using any garage door system in which it is installed.** Its purpose is to safeguard the motor from damage or overheating and completely burning up in the event of a jam occurring upstream of the motor.

Manufacturers of garage door openers utilize a friction clutch to safeguard their electric motors, similar to the approach employed by all industrial designers for motor protection. This method is a straightforward and efficient way to prevent motors from overheating or igniting when the door becomes jammed due to an obstruction.

A sectional garage door opener with a friction clutch must be adjusted to manage the weight of a properly balanced door during its ascent. This applies to both trolley and jack shaft operators. The friction clutch does not compensate for an improperly sprung door system. By design, a friction clutch protects the electric motor and transmission, if present, and does not pertain to pedestrian safety regulations or requirements.

The relevance of a friction clutch in relation to a trolley-type garage door operator, compared to a jack shaft style operator is that the trolley style operator can become jammed in the descending direction as well as the ascending direction. A jack shaft operator can only benefit from a friction clutch slip when an obstruction with the garage door occurs as it is ascending to the open position.

Trolley operators, due to the direct mechanical arm coupling, can continue to exert opener forces if the door becomes impeded in either direction of operations. A jack shaft opener on a stuck descending door will just unspool the lift cables as the door descends. There is no encountered force imparted to the door operator if the descending door becomes stuck. When an overhead door is obstructed in a jack shaft controlled system as it descends, the lift cables will unspool until the limit stops of the opener are reached by count or the limiting spindle stops shut down the motor.

Since a friction clutch is of no use in the descent of a garage door where a jack shaft operator is installed, some manufacturers have developed and provide cable tension monitoring devices that are positioned in contact with the lift cables of the overhead door. When the tensioned cable becomes slack, the cable tension monitors interrupt the motor controller by making contact with a reed switch and shut down the door operator's motor function. This is an extremely effective safety mechanism that not all installations utilize. This is an essential added safety mechanism because once the lift cables become disconnected from the torsion rod spools, the door may free fall.

No friction clutch can be installed or perform the same function as a cable tension monitor. A hung up descending door does not give any feedback to the door operator, as the motor of a jack shaft operator will continue to spin and unspool the lift cables. One of the primary reasons no door operator manufacture relies on the friction clutch, nor claims it as a safety mechanism for pedestrians, is that it is intended solely for the protection of the electric motor.

Since 2010, the UL 325 standards established by Underwriters Laboratories have required that all overhead garage door systems in commercial applications include two forms of safety systems. These systems must consist of a tactile sensor, typically a compressible edge located underneath the bottom of the door, and a non-tactile sensor, typically cross threshold optical holding beams. If either of these two safety devices encounter an obstruction whether it be from ten pounds of compressive force to the bottom edge of the door, or something crossing into the beam path, the door should stop, stall, and reverse

upwards. A door system without these two ancillary safety features, in addition to the inherent auto-reverse function of the motor control, does not comply with UL 325 standards. Unless adopted by local or state building codes, adherence to UL compliance is strictly voluntary. Owners and installers who do not maintain installations that could potentially be made safer through UL compliance risk failing to provide the safest possible installation and may assume legal responsibilities for not making the installation compliant.

Users of all overhead door systems should be aware of and practice safety precautions when working near a moving door. Pedestrians or equipment must never pass underneath an active door, whether it is opening or closing. Pedestrians should not attempt to free a door that has become stuck, as doing so is unsafe and potentially life-threatening. Relying on unknown conditions of door components and risking crush injuries by walking under a moving or stuck door is highly inadvisable. It is recommended that door owners have all garage door components professionally inspected at least once a year, and regularly observe the door daily, weekly, or monthly, depending upon the location and traffic of the door system.

**Why you should retain Mike Panish:**

Mike Panish is widely regarded as the nation's foremost expert witness for overhead and garage doors. He has provided testimony on behalf of plaintiffs, contributing to multimillion-dollar verdicts, and has consistently aided the defense in achieving zero-defense verdicts. To date, he has been retained on over 2500 cases, working equally for both plaintiffs and defendants. Mike is unbiased and will provide you with an honest and straight forward assessment of your case. He can help you determine the responsible parties in each case and will let you know your obligations without hesitation. For the most knowledgeable and proficient expert regarding any door injury claim, Mike Panish is the premier choice. Attorneys who have utilized his expert services can attest to his thoroughness and transparency. He is internationally recognized as an expert for any type of door or gate personal injury case.

Contact Sharon at (888) 902-4272 for immediate response to your case needs, and have a 15 minute free consultation with Mike Panish. With the best expert on your side, you will be fully informed of your position and will have the power to make informed decisions at every step in your claim.