



Security article for May 1999 issue of Doors and Hardware Magazine

Security from a Hinge manufacturer's perspective:

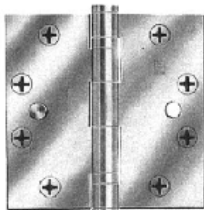
Normally you don't think of a hinge manufacturer as a supplier of many high security features. This can be misleading to the end user because there are actually many products that are security related, from the various hardware manufacturers; various hardware manufacturers, meaning those hardware manufacturers that don't produce locks, exit devices, and other major security items.

First lets look at the various security treatments that can be provided with standard mechanical builder's hardware products. The following features are to be added to regular hinge applications:

Non-removable Pins

This term is a bit misunderstood by the architects and end users. Non-removable does not actually mean that a pin cannot ever be removed, what it actually means, is that the pin may be removed under specific requirements. The non-removable hinge pin (NRP) has a small set-screw in the body of the barrel. It depends on the manufacturer as to the location of this set-screw. Once the hinge is installed and the pins are set in place, the set-screw is tightened down against the hinge pin. The hinge pin has a groove or indentation in the position where the set-screw makes contact, allowing the set-screw to seat itself in the groove or indentation. The set-screw is positioned so it may not be reached unless the door is in the open position. If pin removal becomes necessary, the door must be opened, then the set-screw may be loosened and the pin may be tapped out and the hinge disassembled.

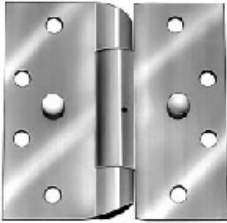
Safety Studs



Safety stud (SH)

The safety stud feature may be applied to a full mortise hinge only. A stud is inserted on one leaf and a hole placed on the opposing leaf surface. When the door is closed the safety stud projects into the opposite leaf face, locking the two hinge leaves together. If the hinge pin is removed, the two hinge leaves remain intact with the safety stud maintaining the integrity of the closed hinge.

Reverse Security Studs



Reverse security stud (RSS)

The reverse security stud is a feature that provides a stud mounted on the back of each hinge leaf. This stud projects into the reinforcement plates in both the door and the frame. The intent of these studs is to keep the hinge locked into place and protect the opening from abuse of battering or trying to shear the screws. The studs allow for approximately thirty-five hundred pounds of shear force to be applied before the studs would fail. This feature is used primarily on prisons and psychiatric areas of hospitals.

Fast Riveted Pin



Fast Riveted Pin

Fast-riveted pins are mostly used in outbuildings and not generally used on commercial applications. However, the method for manufacturing this type of pin is to over-size the pin on each end and then spin the ends to a mushroom shape. This causes the pin to have a shoulder at each end. The only way to disassemble the hinge is to remove one end of the oversized, mushroomed pin-head.

One very important point to be made here is, these four security features are meant to be deterrents only. They should not be considered as high or maximum-security features of a security system.

Other security items:

Heavy Cast Hinges

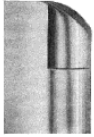
Most manufacturers provide an extra heavy, generally of cast material; this style hinge will carry doors that range in weight from 250 to 600 pounds. The fact that the material is cast is what provides the strength to the hinge. There is not a rolled knuckle to unravel and cause failure. The fasteners are generally a larger type than what is commonly used in commercial construction applications – in-lieu-of $\frac{1}{2}$ x 12-24 machine screws; the additional door weight requires $\frac{1}{2}$ x $\frac{1}{4}$ -20. Most manufacturers use a security type fastener, either spanner head or security Torx head screws. Other various types of fasteners may be purchased from various sources, for additional security.



Institutional Prison Hinges

This is a heavy weight, three-knuckle hinge, most manufacturers supply a stainless steel pin, the pin tip is usually Hospital tipped, and the pin is welded to the knuckle. This hinge will meet the criteria of ANSI A156.1 and 7 for size, material thickness, and screw hole locations. These hinges will carry a door weighing up to 300 pounds.

Hospital Tip

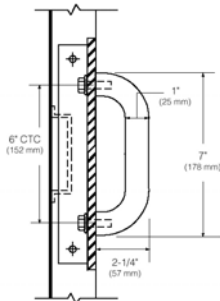


Hospital Type

Hospital-tipped hinges are now primarily used in prisons and psychiatric areas of hospitals. This type of hinge tip prevents items from being hung on the knuckle of the hinge pin and possible harm to people in the room.

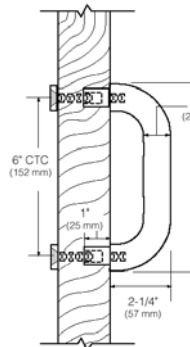
Special Security Pulls

Security Pulls have several different fastening features, which are not common to the methods of fastening regular pull bars. The most obvious is that the fasteners, when exposed, are usually spanner, security Torx, or a hybrid fastener. Some mounting variations are concealed inside of the door or behind the door skin, to a plate welded inside the door, for protection and difficulty of tampering. One example of this is indicated to the left. As shown the fasteners are standard hex head bolts, but they are located inside of the door and are only accessible by removal of an access panel on the edge of the door. The access panel should be supplied with spanner, security Torx, or a hybrid fastener.



Another style of mounting consists of exposed fasteners but these are generally

on the non-secure side of the pull, however, they would still be supplied with, spanner, security Torx, or a hybrid fastener. This type of pull is again used where the pull provides no access for removal from the secure side of the opening. As indicated in the sketch, the mounting lugs are concealed on the inside of the door, only in this case, the fastener heads are located on the surface of the non-secure side of the opening.



Latch Protection Plates



This type of plate is used to protect the latchbolt or deadbolt from tampering and vandalism. It is used especially where door latches are vulnerable to break-ins due to exposure to the outside and poor or little visibility. These are an excellent means of protecting life safety, as well as costly product inventory for store owners and manufacturing facilities. Actually any commercial buildings can use this type of product to protect out-swinging doors from intrusion.

Electrified Security Products:

Electric Hinges

Electric hinges may be provided with two different methods of electrification; first is the exposed version, and second is the concealed version. When considering the exposed version of the electrified hinge, keep in mind that the electrification is exposed to the surface of the hinge leaves. This is visible to the personnel using the doors, when the door is in the open position. *Exposed electric hinges would not be the best products to use if the intent is to have a high security opening.* These hinges would serve the purpose well for emergency exit doors on the exterior doors of a manufacturing facility, warehouse, or other large spaced building. Exposed electric hinges may provide power transfer, adjustable monitoring capabilities, or a combination of both.



With power transfer capabilities on the exposed version, the number of contacts are fairly limited. Only four exposed contacts may be mounted on the face of a single hinge leaf. With some of the newer locks and exit devices, additional wires are required to provide sufficient power to operate all functions of the lock or exit. The exposed version can not provide all the necessary power to perform these functions.

The contacts actually make physical contact with one another and transfer the power in this manner. Once the door opens, contact is lost and power is no longer being transferred. In most cases this is not a problem because the work has been performed, and the lock is only waiting to be re-secured.



With adjustable monitoring, the switch is usually a Single Pole Double Throw (SPDT) type. This provides normally open, normally closed, and a common pole to make connections to. With this type of switch, the decision may be made in the field as to the method of monitoring – Is a signal needed when the door is opened or when closed? Adjustment of switch sensitivity is allowable with the adjusting post on the face of the opposing leaf. Since not all manufacturers adjust their hinges in the same manner, be sure to check with the manufacturer's installation instructions for the method being used.

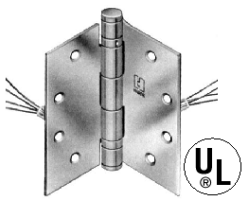


A combination of both features may be requested for use. This is also available. Both the monitoring of the door and transfer of power may be provided. Due to the lack of physical space, only two or three contact wires may be provided. This will severely limit the type of locking functions that may be used. But as mentioned above, certain applications may only call for this limited application.

Concealed Electric Modifications

The concealed type of modification is that which provides additional security. The electric modifications are concealed on the back of the hinge leaves, and therefore are not visible to the personnel using the openings. Security to the opening is not exposed and may be considered to provide a greater level of security.

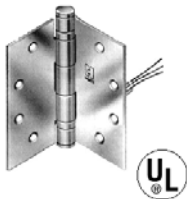
There are three various modifications offered by most manufacturers for concealed electrical hinges; power transfer, adjustable monitoring and again a combination of both.



The concealed power transfer type provides up to twelve power leads from the frame side of the hinge, through the hinge knuckle, and into the door side of the hinge. With various locks requiring more and more features, it becomes increasingly important to be able to provide all the necessary power.

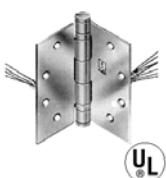
The electrically modified hinges may not be a great portion of an over all security project but this product will allow other hardware items to function properly, without a great deal of additional expense, and still supply one of the basic components of the circuit, and that is the conductor.

The next item to discuss is the adjustable concealed monitoring function. This feature provides, once again, an adjustable monitoring switch. The switch is usually a Single Pole Double Throw (SPDT) type. As stated before, this provides normally open, normally closed, and a common pole to make proper connections. With this type of switch, the decision may be made in the field, as to the method of monitoring – Is a signal needed when the door is opened or when closed?



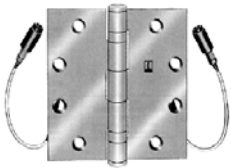
Adjustment of switch sensitivity is allowable. Depending on the way each manufacturer modifies their product will depend on their method of adjustment. One word of caution pertaining to adjustment – Don't try to adjust the switch to too fine a point. With the movement of buildings or the wind conditions in some areas of the country, an adjustment too close may cause false alarms. Since not all manufacturers adjust their hinges in the same manner, be sure to check with the manufacturer's installation instructions for the best method to be used.

The third type of concealed modification is actually, the combination of the monitoring and power transfer features. This provides both monitoring of the opening and the ability to transfer power to other electrified hardware devices in one hinge. These features operate just as mentioned above. The only exception is that both features are in one hinge.



Check each manufacturer for the maximum electrical ratings that they claim for each individual modification type. This information is important when designing a security system.

Air Transfer Hinges



One final modification to hinges, and that is for pneumatic modification. Based on certain security requirements and some industrial security measures, it is necessary to provide a spark-free environment. When this is necessary, the only means of powering some locks and exit devices is with compressed air. To do so, it is necessary to provide compressed air to make the devices operate. This is again possible, through the use of a hinge to transfer the power. The hinge is modified in the same manner as the electrical power transfer hinge, with only one difference – instead of wires being pulled to make electrical connections, air tubing is pulled through to provide a path for 80 – 100 PSI (pounds per square inch) compressed air.

In conclusion, there are many products of the peripheral hardware manufacturers that add to the everyday security of today's buildings. Not all of the products offered are of the electrified variety that we hear so much about. It is not necessarily how expensive a product may be but how that product may be incorporated into the overall mix of a project and coordinate with other products to complete the package.

To offer the best hardware project for your client, know the products that are available in this industry. Know how these products work. Feel confident when requested to specify a product or group of products, that they will perform the job with satisfaction. If you want to increase your comfort level of electrified hardware components, I would recommend attending the DHI - EH-1 Electrified Components course, held in either Tempe, AZ or Orlando, FL. If the project calls for electrified components – become involved. If you don't someone else will!