Electromagnetic Locks and Electrified Door Hardware

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Misunderstood
The Godfather of Maglocks
What Started It All

The First Maglock
Agenda

- Overview
- OBC/NBC Application, Enforcement and Overview
- Types of Delayed Egress Devices
- Differences between the OBC, NBC, and HRSDC
- OBC/NBC and HRSDC and other Interpretations
- Application and Installation Issues
- What’s New?
Needs and Wants

Building Owners:

**NEED:** To control access to buildings using quick, cost effective means

**WANT:** Quickest/cheapest method possible

Therefore:

**MAGLOCKS = GOOD**
Fire Protection and Life Safety Industry:

**NEED:** To get people out as quickly as possible through unimpeded exits and other means of egress.

**WANT:** To control or eliminate security devices that may impede egress or reduce the level of life safety

Therefore:

**MAGLOCKS = BAD**
Ontario Building Code:

Maglocks are a fact of life. Code Officials are empowered to regulate safety in buildings from fire, structural collapse, air quality etc.

Therefore:

MAGLOCKS = REGULATION
SUMMARY

A LITTLE MATH........

(SECURITY + MAGLOCKS )
+
(LIFE SAFETY + MAGLOCKS)
+
(REGULATION + MAGLOCKS)
=

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CONFUSION
THE PLAYERS

- Security system manufacturer
- Security equipment supplier (almost exclusively through dealerships)
- Security consultant (sometimes – this is changing)
- Security electrical installer (i.e. NOT an electrician or licensed technician)
- Electrician when wiring installed in conduit
- Fire alarm system manufacturer (and distributor in some instances)
- Fire alarm design engineer
- Fire alarm electrical installer
- Door and hardware installer
- Building Owner
- Tenant representative
- Authority Having Jurisdiction
- Commissioning Agents
CONFUSION + MULTIPLE PLAYERS = MORE CONFUSION
3.3.1.12(2): A door in an access to exit shall be readily openable in travelling to an exit without requiring keys, special devices or specialized knowledge of the door opening mechanism (except contained use area or impeded egress zone – (i.e. prisons and the like).

— Access to exit: that part of a means of egress within a floor area that provides access to an exit serving a floor area.

— Means of egress: includes exits and access to exits and means a continuous path of travel provided for the escape of persons from any point in a building or in a contained open space to a separate building, an open public thoroughfare, or an exterior open space that is protected from fire exposure from the building and that has access to an open public thoroughfare.
3.4.6.15.(1): ...locking, latching, and other fastening devices on every exit door shall permit the door to be readily opened from the inside with not more than one releasing operation and without requiring keys, special devices or specialized knowledge of the door opening mechanism. (3.4.6.16 in the 2012 OBC)

3.4.6.15.(4): Maglocks are permitted on exit doors if installed per the code and if all doors in the access to exit that are also provided with similar devices release per the code. (3.4.6.16 in the 2012 OBC)

This pretty well takes in all egress doors.
Terminology

ELECTROMAGNETIC LOCKS
Terminology

ELECTROMECHANICAL LOCKS
Terminology
TERMINOLOGY

Electric Strikes
ELECTROMAGNETIC DOOR HOLD OPEN DEVICES –

*These have nothing to do with my presentation or electromagnetic locks!!!!!*
Controlled Egress Devices (Chexit, ElectroGuard)
FAIL SAFE – cannot be “fire” listed as they don’t latch when power is removed - power required to lock the door
FAIL SECURE – can be “fire” listed and stay latched when power is removed. Power required to unlock the door
Terminology

Secure or Unsecure Side of Door?
Terminology

Secure or Unsecured Side of a Door?
Exit Device (panic device, panic hardware, crash bar) – a type of lock having an inside release bar, when depressed, retracts the latch bolt permitting the door to be opened. Sometimes provided with a key function and with a dogging feature – CANNOT BE USED ON FIRE DOORS
FIRE EXIT HARDWARE — EXIT DEVICES WHICH HAVE BEEN LABELED FOR USE ON FIRE DOORS. THERE IS NO DOGGING FEATURE PERMITTED
“Underwriters Laboratories Marks

- UL
- UL US Listed
- Classified UL US
- UL
- UL US
- UL
- UL US
- UL US

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Summary – Revision #2

CONFUSION

+ MULTIPLE PLAYERS

+ TERMINOLOGY

+ MULTIPLE LISTINGS

= WELCOME TO WHERE WE ARE TODAY
The 2006 OBC and the 2010 N.B.C

- NBC is the Model document for all other provincial Building codes.
- Some provinces adopt the NBC in its entirety.
- Other provinces use it as a base document and tailor it towards their own specific provincial needs (as is the case in Ontario).
- NBC enforced in Ontario on federally regulated buildings (i.e. Buildings owned/ by the Federal Government or leased by the Federal Government) but sometimes the both NBC/OBC enforced for same building. Enforce HRSDC Policy IPG-044.
- Federally, every maglock installation requires submittal of plans and specifications to HRSDC for review.
The 2006/2012 O.B.C.

- Enforced by municipalities in Ontario
- Overseeing body is The Ontario Ministry of Municipal Affairs and Housing (MAH)
- Excellent web page for information on BCC rulings: [http://www.mah.gov.on.ca/Page9815.aspx](http://www.mah.gov.on.ca/Page9815.aspx)
- Last BCC over 13 years ago. Last BMEC was 2009 and before that 1991 (for electromagnetic locks)
- Don’t like a municipalities opinion? You can formally ask for an opinion from the MAH
- Every maglock installation will require a building permit application with plans and specifications prepared by a professional engineer or architect
- Every maglock in Ontario requires an electrical permit
• “Electromagnetic locks are intended for use where there is a need for security additional to that provided by traditional exit hardware”

• THEY ARE NOT INTENDED FOR INDISCRIMINATE USE AS ALTERNATIVE LOCKING DEVICES

• If more than one electromagnetic locking device is used in a building, it is expected that one switch will release and reset all devices simultaneously.

• If installed on doors in required fire separations, then must have a positive latching mechanism as well.
Maglocks are also NOT permitted on exit doors in

– Elementary or secondary school, (OBC only)
– From high hazard industrial occupancies

– Doors having panic hardware (assembly occupant loads over 100 people, doors into exit lobbies and doors from exit stairs to outdoors with a building occupant load over 100) – except in residential care facilities.
OBC/NBC Interpretations and Opinions

• Electromechanical locks now approved by HRSDC for installation on Parliamentary Precinct Building except on exit stair doors. Can be installed on service room doors etc. EACH INSTALLATION WILL REQUIRE SPECIFIC APPROVAL FROM HRSDC. (NBC)

• Chexit and electroguard and other delayed egress devices are to be installed and operated in the same manner, generally, as electromagnetic locks except HRSDC require a manual pull station installed to release the door immediately (NBC applications for federal buildings by HRSDC). (NBC)
OBC/NBC Interpretations and Opinions

- Chexits do not require an adjacent MPS to release the device (OBC BMEC 91-7-155)

- Chexits DO require an adjacent keypad to immediately release the device (OBC – BCC 96-11-494)

- NBC style maglocks permitted on exit doors in gaming premises but only if smoke detectors provided in each room and corridor accessible to the public and the building is sprinklered. Now written into the OBC (OBC)
  - Pressing on door hardware will unlock door within 15 s and door does not relock until it has been opened

- 15 second delay is cumulative of all locking devices – NOT 15 sec at each locking device (HRSDC, municipal enforcement, Branch Opinion)

- Each maglock installation to be inspected by Electrical Safety Authority. (OBC)

- Maglocks are to release upon interruption of the electrical supply to the building (both normal and emergency), the fire alarm system or the maglocks. (OBC – Branch Opinion)
• Failure refers to interruption of both the primary and standby powers. (OBC - Branch Opinion)

• Release under ground fault conditions has been interpreted in the past to mean a ground fault in the primary 120 volt supply to the maglocks. (OBC – Branch Opinion)
  – Since clarified to a failure in the electrical circuit between the FACP and the controller of the locking device. In the OBC now. Also includes failure of the data loop in an addressable system

• Maglocks DO NOT have to release during the generator transfer time so long as the transfer time is less than 15 seconds. If it is longer than 15 seconds, then all maglocks must release. (OBC – Branch Opinion)
• Card access to release a door during non-emergency situations is permitted to have up to a 15 second delay but signage has to be posted on the door. (OBC - Branch Opinion – April 1995)

• Maglocks are permitted on cross over floors but need MPS on both sides of door and MPS in stair to be zoned with the stair. (OBC - Branch Opinion – April 1995)
  – Issue: Signage should not say “Emergency Exit Unlocked By Fire Alarm” – Should Say “Accessible Floor. Door Unlocked By Fire Alarm”.

• Chexit and Electroguard and similar are permitted but must release on fire alarm, manual switch or after pressing on door for 2 seconds and 15 seconds later door releases (sign required) – NO manual pull station is required – different from NBC which requires a manual pull station. (OBC – BCC – 98-46-651)
  – Based on a Home Depot project in Kanata – not stated anywhere else in the OBC
OBC/NBC Interpretations and Opinions

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- A fire alarm system that does not fully comply with the OBC must be upgraded/replaced if maglocks are to be installed (OBC – 95-28-448)
Installation and Application Issues

How much work can you do to a door before the listing is void?

– Grey Area – reference NFPA 80, 1-3.4

Preparation of fire door assemblies for locks, latches, hinges, remotely operated or remotely monitored hardware, concealed closers, glass lights, vision panels, louvers, and astragals, and the application of plant-ons and laminated overlays shall be performed in accordance with the manufacturer’s inspection service procedure and under label service. (See Appendix F and Appendix G.)
How much work can you do to a door before the listing is void?

- Grey Area – reference NFPA 80, 1-3.4

Exception: For job site preparation of surface-applied hardware, function holes for mortise locks, and holes for labelled viewers, a maximum 3/4-in. (19-mm) wood and composite door undercutting, and protection plates (see 2-4.5) shall be permitted. Surface-applied hardware is applied to the face of a door without removing material from the door other than drilling round holes through the face of the door to accommodate cylinders, spindles, similar operational elements, and through-bolts. The holes shall not be permitted to exceed a diameter of 1 in. (25.4 mm) with the exception of cylinders.
Installation and Application Issues

• Generally, all doors have to be listed to accept specific hardware

• It MUST be looked at as a door opening system - not individual pieces

• If you core drill through a door to run some power wiring – the listing is, in most cases, void.

• Ask for a copy of the manufacturer’s literature/correspondence clearly indicating that the affected door is listed to have the identified hardware and security devices installed.
Installation and Application Issues

Immediate release on fire alarm – processing can take up to 20 seconds in some instances – new ULC standard – no more than 5 seconds

MPS with dual contacts – for immediate release

Single switch for manual release and manual reset – BMEC rulings have allowed a second switch but the “required” switch must take precedence

**ANYBODY** can work on a security system from **ANYWHERE** – IP enabled – this is a **MAJOR** risk factor affecting reliability and life safety – Certification is the way to go
Installation and Application Issues

• Group maglocks to area of coverage for each transponder otherwise will have release issues during stand alone/degrade modes of operation – test for this!

• Try to match security controller area of coverage to fire alarm transponders – need for unified approach

• Can’t use an addressable relay – does not fail safe – stays in position it was in before power failure – be specific – some manufacturers can now program a particular relay to operate in this manner – test for this!
Installation and Application Issues

• Unplugging of power supplies for security systems – will reset when power re-introduced – not per Code

• Supervising of release relay

• MPS at barrier free height if barrier free path of travel

• Need CFAA trained technician for MPS installation to maglock
Installation and Application Issues

• Issues of differing voltages of maglock controllers – fire alarm is always 24VDC

• Release on first stage of FAS operation – even if first stage is silent operation.
  – OBC allows release on second stage for care or detention occupancies.

• All MAGLOCKS in entire complex to be released on any alarm (NBC allows release based on area of coverage of transponder).

• Degree of testing during the approval stage varies
Installation and Application Issues

• Fire alarm loss of power: If no batteries and breaker turned off – generator does not start and fire alarm does not work and maglocks do not release.

• Blue manual pull stations – if red one is there too it is allowed (via Code silence) but is VERY confusing.

• Supervising circuit from fire alarm to security controller – release on fault in circuit – normally not electrically supervised unless addressable relay
Installation and Application Issues

• Bypass switch allowed in OBC however a system trouble (visual and audible) has to be initiated and the trouble signal has to be sent to the monitoring station.
  – Issue: if a monitoring system is not otherwise required – does this clause require one? Some say “yes” and others “no” – my opinion is it should be “yes”

• Emergency lighting at the doors – Code does not reference what level of lighting is required
  – a performance based approach is typically taken
  – “can you read the sign on the door?”

• Electromagnetic locking systems are anything but a “system” unless you follow the HRSDC approach. Maglocks are always patched together.
Installation and Application Issues

• Maglocks are NOT to be reset after releasing from a power loss when the 120VAC (or power) is re-established. Only the reset switch can reset the maglocks.

• Maglocks are not to be re-energised via re-setting for the fire alarm system after having been released by the fire alarm system. Only the reset switch can reset the maglocks.

• Maglocks are not permitted to be re-set locally by a local re-set switch, after any type of release. Only the reset switch can reset the maglocks.
INSTALLATION ISSUES

Which is the right exit?
Chexit Device with keylock, no signage, in a large Assembly Occupancy
When you absolutely, positively, MUST secure 2 office doors
This is NOT an emergency exit – contrary to the sign – sign is confusing and handicap operator overrides 15 second delay
INSTALLATION ISSUES

Nice Doors – Are they Safe?

– No emergency lighting, no signage, no dual contact MPS,
INSTALLATION ISSUES

How do you get out?
INSTALLATION ISSUES

A SINGLE SWITCH TO RELEASE AND RELOCK ALL MAGLOCKS
INSTALLATION ISSUES

Is this an exit?
What you don’t see
A home-made controller and custom wiring
INSTALLATION ISSUES

Red or Blue – can you decide?
What’s New?

Anti-bacterial coatings on all door hardware (silver based product)

Square bolt hardware:

- Latch Pullback
- Electric Dogging
- Mortise Device Trim Control
- Touchbar Monitor or Signaling
- Outside Trim Monitor or Signaling
- Bolt Position Monitor or Signaling
- SecureX® Delayed Egress
- Electric Trim Control
- Exit Alarm

Certified Fire Door Assembly Inspector – DHI/NFPA 80
What’s New?

InterTek program - buy special tool to core doors – technician is certified and can apply their own label
Pre-wired doors and frames from the manufacturer
Motorised latch retraction on panic hardware (IP Enabled)
Electrified
lock sets
(IP Enabled)

Electrified Mortise
locksets (IP Enabled)
What’s New?

Electrified cylindrical locksets (IP enabled)
What’s New?

Photo luminescent door hardware
What’s New?

Photo-luminescent door hardware, trim, frames
What’s New?

Wireless card access from your smart phone
What’s New?

Wireless card access and control

[Image of wireless card access and control system]

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Wireless and LED

Brighthandle Levers - These levers will illuminate when the door is locked - Privacy function only

- Aurora Dot
- Luna Dot
- Aurora Fuse
- Luna Fuse
- Aurora Inside Trim
- Luna Inside Trim

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The Wrap Up

• Do your homework, be thorough, challenge the professionals and ensure safety.

• Ask for test records and certification documents.

• Check for ULC or other regulatory labels on all equipment.

• You are also a guardian of the public trust – review and test maglock systems with this in mind.

How A Maglock should be wired:

- **Fire Alarm Relay**
- **Card Access Relay**
- **Maglock Power Supply**
- **Maglock**

Normally Open, Powered Closed (failsafe)

Maglock Master Control Switch

Figure 1 - Maglock Power Supply Circuit
A quick reference check list:

<table>
<thead>
<tr>
<th>Maglock Checklist</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location allowed by NBC/OBC?</td>
<td>✓</td>
</tr>
<tr>
<td>Type allowed by OBC (no pins or latches)?</td>
<td>✓</td>
</tr>
<tr>
<td>Building Equipped with fire alarm?</td>
<td>✓</td>
</tr>
<tr>
<td>Lock connected to fire alarm as ancillary device?</td>
<td>✓</td>
</tr>
<tr>
<td>Fire alarm programmed for release of lock?</td>
<td>✓</td>
</tr>
<tr>
<td>Power supply for maglock set to release on power loss?</td>
<td>✓</td>
</tr>
<tr>
<td>Bypass/Rearm switch?</td>
<td>✓</td>
</tr>
<tr>
<td>Fire alarm pull station installed?</td>
<td>✓</td>
</tr>
<tr>
<td>Door sign?</td>
<td>✓</td>
</tr>
<tr>
<td>Trouble signal when bypass activated?</td>
<td>✓</td>
</tr>
<tr>
<td>Emergency lights?</td>
<td>✓</td>
</tr>
</tbody>
</table>
Sometimes You’re Screwed Even When You Do The Right Thing

“Well, thank God we all made it out in time. ... 'Course, now we’re equally screwed.”

www.LRiFire.com
And When You Finally Get Through All The Locked Doors and Still Need Help Evacuating…….
BLATANT MARKETING

Thanks!

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