TURNSTILES.us.™
SECURING THE U.S. and the GLOBE

Operation Installation and Maintenance

Turnlock

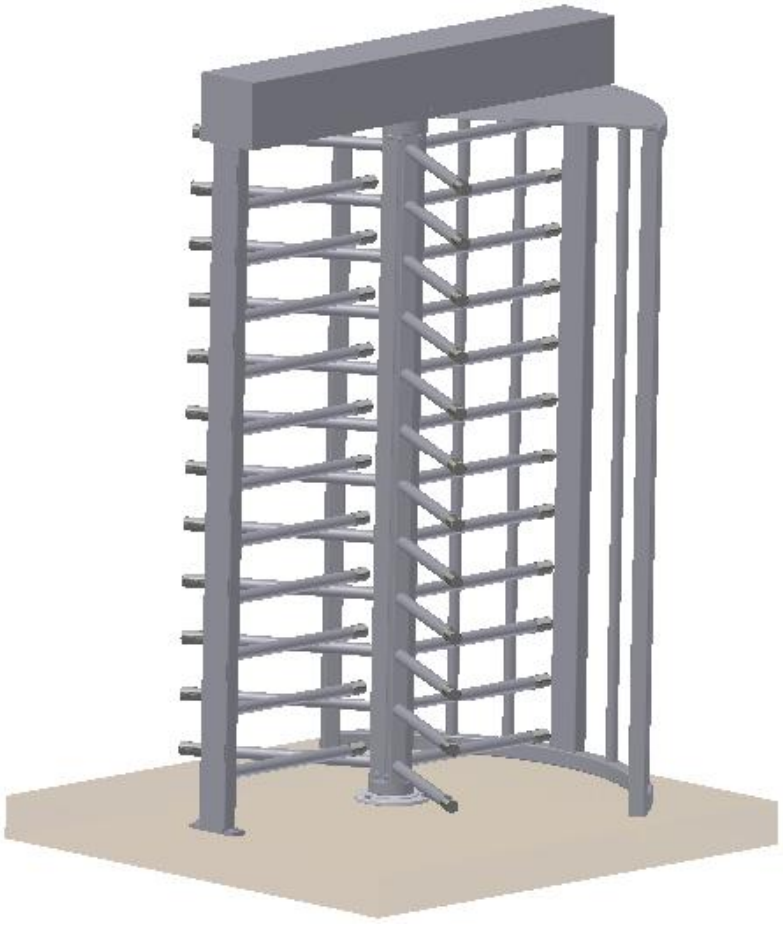


Table of Contents

GENERAL INFORMATION

1. Introduction

This manual is written for the service and installation engineer, it provides information about:

- Operating the Product.
- Installing the Product.
- Electrical characteristics of the Product.
- Maintenance on the Product.

Please read this manual carefully, it contains information that will assist you with all aspects of installation and maintenance, including operation of electrical parts, so that a long and useful machine life can be achieved.

1.5 Abbreviations

- FL Fail Lock
- FS Fail Safe
- FL/FS Fail Lock Entry Fail Safe Exit
- NE No Exit
- CW Clock-Wise Rotation
- CCW Counter Clock-Wise Rotation
- ACS Access Control System
- N.C. Normally Closed
- N.O. Normally Open
- MCB Main Control Board
- I/O Input / Output
- JP Jumper (Control Board)

1.6 Symbols

Warnings and cautions

	**WARNING!** Risk of personal injury or loss of life.
	**CAUTION!** The material may be damaged or the operation of the product affected.

1.7 Product Safety

1.7.1 Installation and maintenance Safety

	**WARNING!** Switch off the power supply of the product before working on the product.
	**WARNING!** When the power supply cannot be switched off, service and maintenance activities are to be undertaken only by trained engineers fully aware of potential danger involved.
	**WARNING!** Be aware and avoid contact with moving parts.
	**WARNING!** Check that all safety devices and systems are fully operational after installation of the product or after maintenance has been carried out.
	**WARNING!** It is not allowed to make changes or switch off any safety features without authorization from TurnstilesUS
	**WARNING!** Make sure that the dynamic and static forces are within the permissible values. See Safety Instruction for further details.
	**CAUTION!** The material may be damaged or the operation of the product affected if the installation procedure is not followed correctly.
	**CAUTION!** Some of the electronic components in the products covered by this manual contain Electro Static Discharge (ESD) sensitive devices. It is highly recommended that service and maintenance engineers follow the ESD guidelines and procedures when handling such devices.

1.7.2 Operational Safety

	**WARNING!** Any children or minors using the product must be supervised and accompanied by a responsible adult.
	**WARNING!** This product should not be considered as a playground.

2. Product description

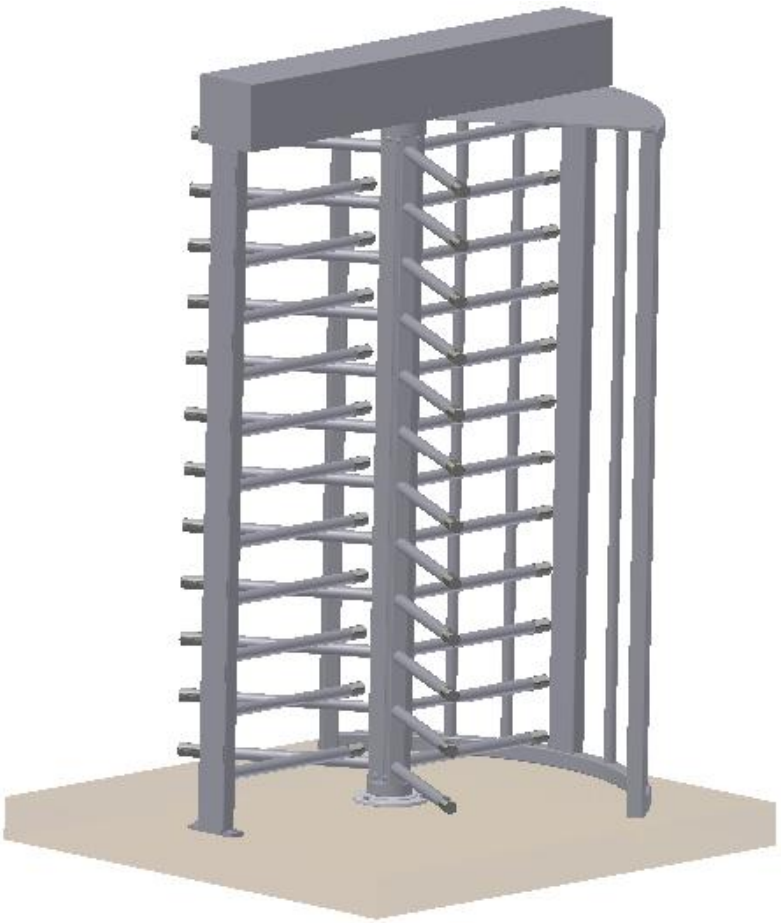
2.1 General

The Turnlock Full Height Turnstile is available in a variety of models and configurations consisting of a central rotor assembly, Shield Assembly, Barrier and Top Channel Mechanism.
The rotor assembly turns on a central axis preventing passage through the Barrier while allowing authorized entry/exit through the Shield Assembly passage of the turnstile. Size of the turnstile can vary but is typically small enough to discourage two persons passing the Turnlock.

The typical sizes of a 25" (50cm) width rotor arm, result in a capacity of 25 to 30 persons per minute in one direction, depending on the authorization system chosen.

A variety of surface finishes are available in galvanized, powder coat and stainless steel, aluminium anodized and even a combination of metals such as aluminium and stainless steel together.

All described components are provided in the Turnlock unless otherwise noted with an asterisk (*) as optional equipment or versions. The Turnlock is a manually operated product, actuated/controlled by an integrated Main Control Board (MCB) located in the Top Channel Assembly Mechanism.

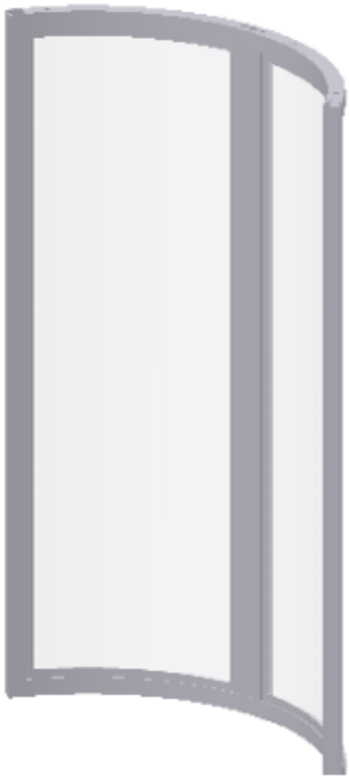


Turnlock 100

2.2 Shield Options

The Turnlock can be configured in a variety of Shield Assembly options. The following shield options are commonly available.

A – Standard Shield



B – Shield with Lexan panels

2.3 Barrier Assembly Options

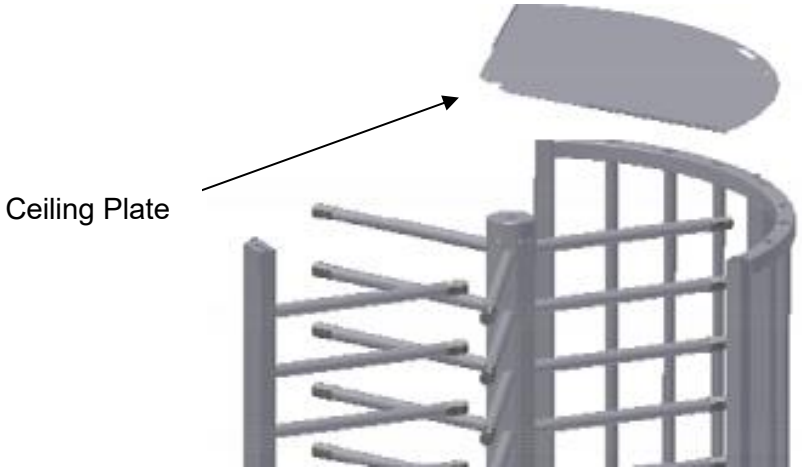
The Turnlock can be configured with a variety of Barrier Assembly options.
The following Barriers are commonly available. Barrier Bars may vary in finish and material depending upon order.

A B C

(A) Standard Barrier.
(B) Optional Barrier with Horizontal Strips.
(C) Optional Barrier Lexan Panels with Horizontal Strips.

2.4 Ceiling Plate

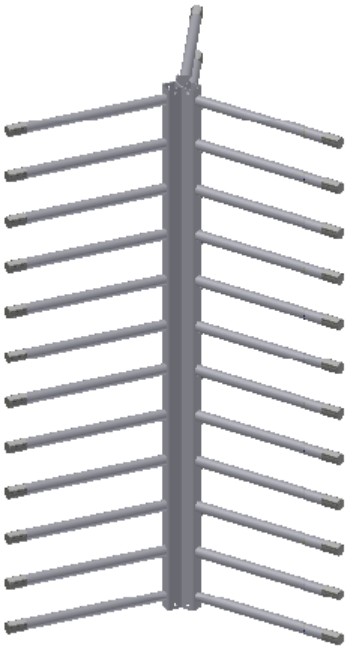
The Ceiling Plate consists of a flat angled sheet material (in matching finish) which is fixed between the Top Channel Assembly and the Barrier.



Ceiling Plate Exploded View

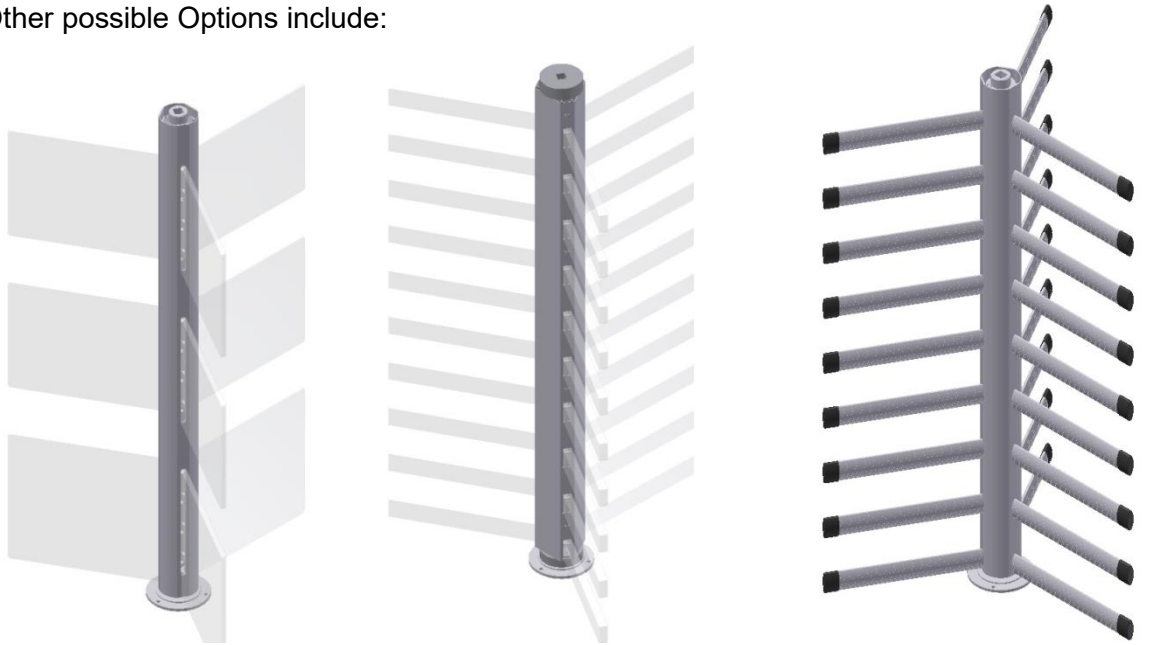
2.5 Rotor Arm Options

The Turnlock can be configured with a variety of Rotor Arm assembly options.
The following Rotors are commonly available.



Turnlock 100 Rotor Arms, (Powder Coat, Stainless or Galvanized)

Other possible Options include:

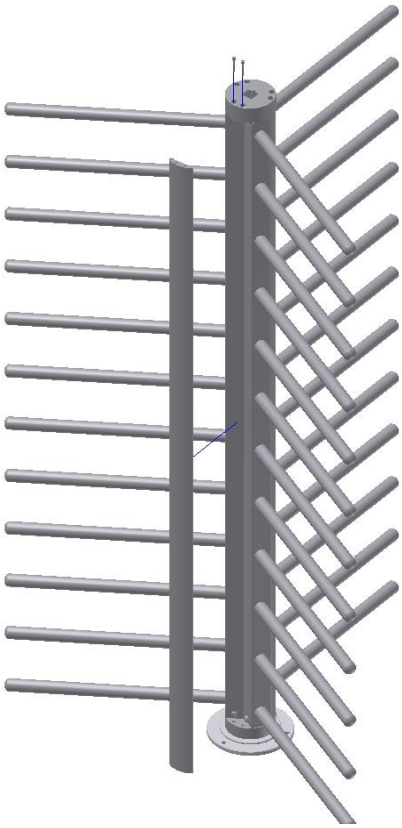


A – Turnlock 250 B – Turnlock 200 C – Turnlock 150

Optional Rotor Arms, (Turnlock 250, 200 and 150)

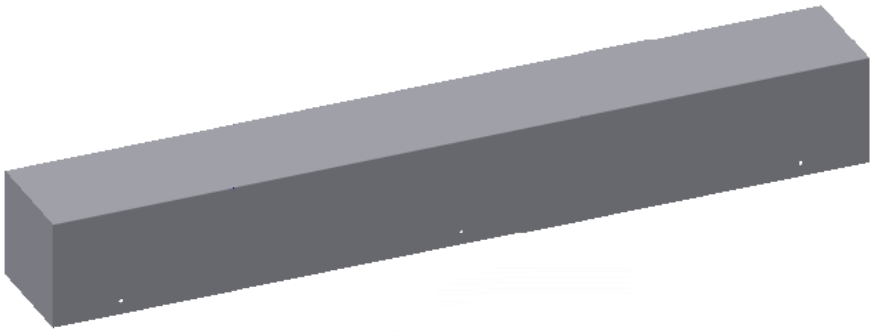
2.6 Rotor Infill Covers (Option)

Optional infill cover pieces can be ordered which cover the center flange bolt assembly area on the Standard Turnlock rotor arms (note similar snap-in covers are standard on the Turnlock 250, Turnlock 200 and Turnlock 150 models).



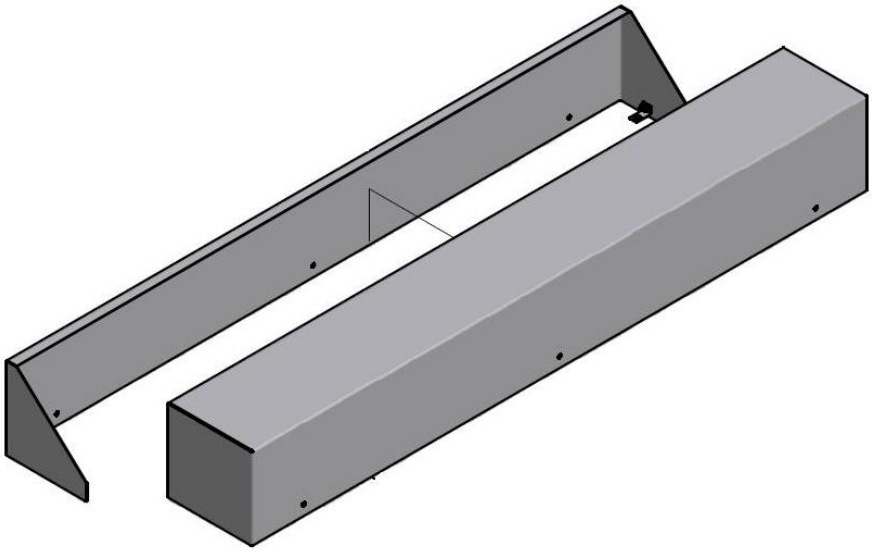
Infill Cover (Option)

2.7 Top Chanel Cover Options

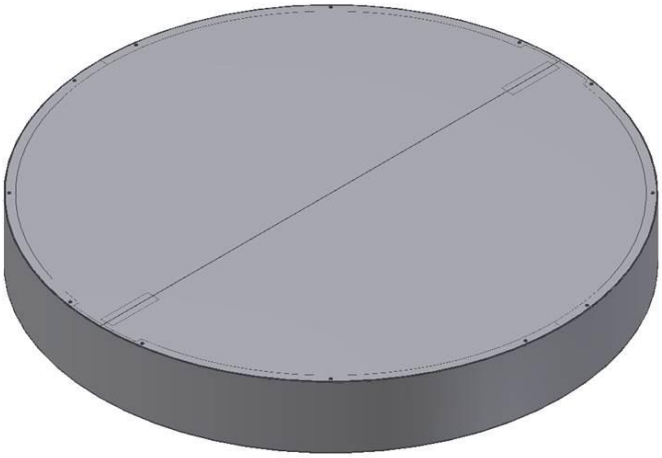


Standard Lift Off Cover (Standard)

Other possible top channel cover options include:



Two Piece Cover (Option)



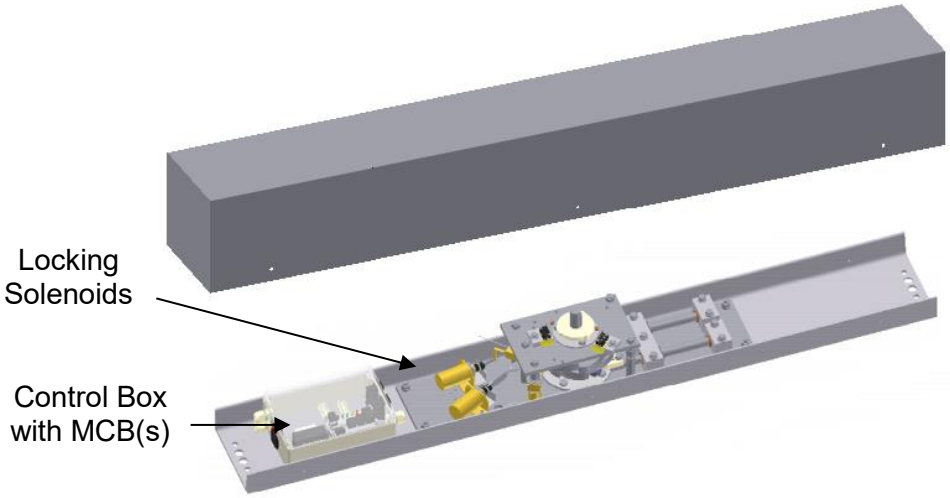
Round Canopy Cover (Turnlock 200 Option)

Not pictured top channel cover options.

- Hinged Cover
- Panel Cover
- Square Canopy

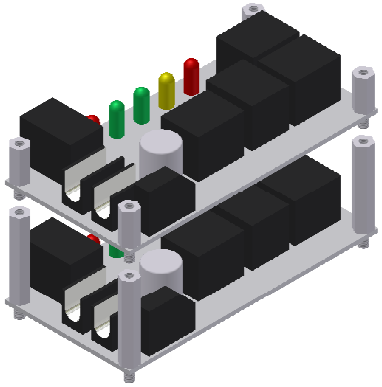
2.8 Control System

The Turnlock Control Box is located in the upper Top Channel Assembly. Typical mains power supplied to the control system is 110-230VAC (refer to project specific drawings and specifications). Within the Control Box, the Main Control Board (MCB) is powered by a 24VAC power supply system which actuates the locking solenoids which in turn allow the turnstile to lock and unlock.
A one-way controlled Turnlock incorporates one MCB and related components (for the direction of access control), and a two-way controlled Turnlock utilizes two MCB's and related components (one set for each direction of access control).



Top Channel Assembly

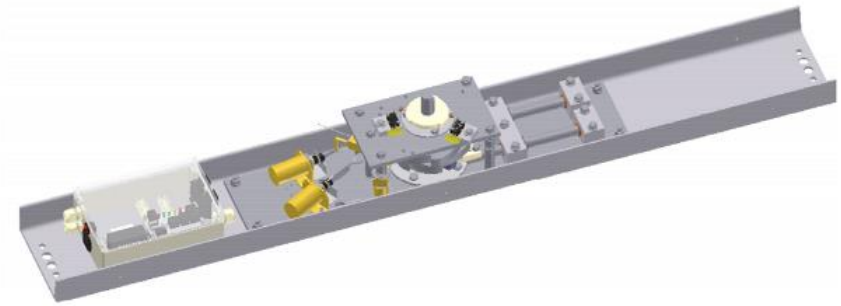
The MCB(s) and Solenoids are located within the control box and typically are stacked on top of each other as shown.



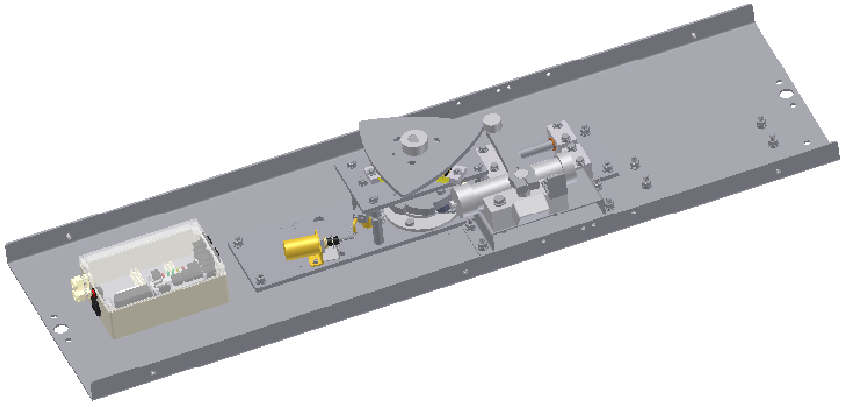
MCB Stack Assembly

2.9 Speed Control unit

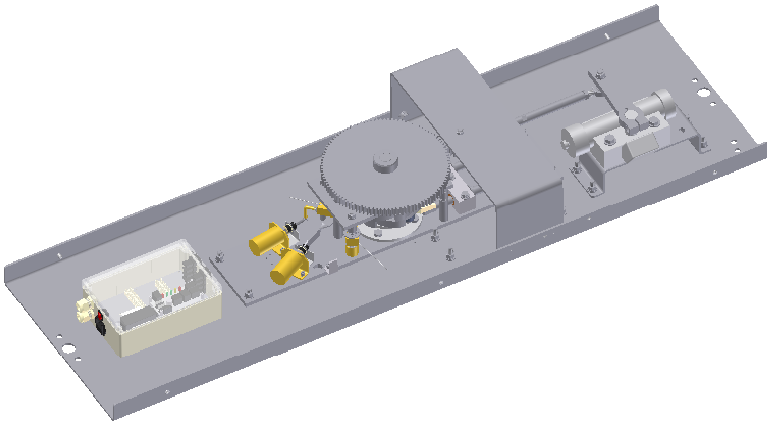
There are three possible options for speed control system of the Turnlock. Refer to the model supplied and verify the type of speed control used:



Top Channel No Speed Control – Standard



Top Channel Triangle Speed Control (Option)



Top Channel Gear Speed Control (Option)

3. Operating concept

3.1 Operating functions

There are many available operating functions of the Turnlock below is a list of typical configuations. Keep in mind that only one configuration is possible per assembly and is determined when the unit is manufactured. Changing the configuration of the unit can be done in the field.

3.2 Locking

Fail Safe - When power is turned off (denied), this configuration provides Fail Safe rotation in the specified direction of travel.

Fail Lock - When power is turned off (denied), this configuration provides Fail Lock in the specified direction. No rotation is allowed in the specified direction.
All Fail Lock units come equipped with a mechanical key override to override the locking system to allow for free spinning of the rotary arms.

Key Override (Mechanical) - This key switch is typically found on any Fail Lock direction unit on the underside of the top channel near the upper flange assembly. When switched to override mode, Fail Lock function can be bypassed for free egress in the selected direction. Note: FL/FL units will have two key overrides.
When power is restored to the unit, the system will automatically restore to its normal operating function.

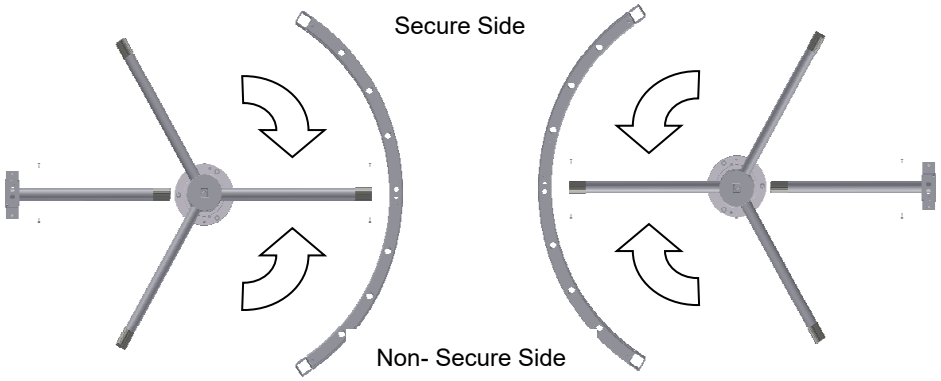
Note: Any combination of the above mentioned functions is available in the following configurations:

- Access Control Rotation (i.e., Card read activation)
- Free Rotation
- No Rotation

3.3 Direction types (Clockwise, Counter Clockwise)

The typical Turnlock rotates in a Counter Clockwise (entry from non-secure moving into the secure) direction. When authorization is granted, the unit can be manually rotated for one segment (120 degrees) and return to the rest position and lock. Likewise, for exiting from the secure to the non-secure side, the unit rotates in a Clockwise direction.
Note: Some units may be ordered with Clockwise entry and Counter Clockwise exit. Always refer to your order for proper rotating direction.

- **Controlled access CCW and CW direction:** Both rotating directions require authorization. The rotating section of the unit will become unlocked for the desired direction upon Access Control System (ACS) signalling to the Turnlock control system that access has been granted.
- **Controlled access in one direction and free access in the opposite direction:** Only one direction requires authorization. The other direction does not require authorization and rotates freely when pushed.
- **Controlled or Free access in on direction and No Access in the opposite direction**: Access is only allowed in one direction (via access control or free access in). The opposite direction does not allow traffic to pass.
- **Free Access in both directions**: There is no access control connected to this type of unit and it will freely spin in either direction.



Turnlock Plan View Examples
Layout and Rotation Directions

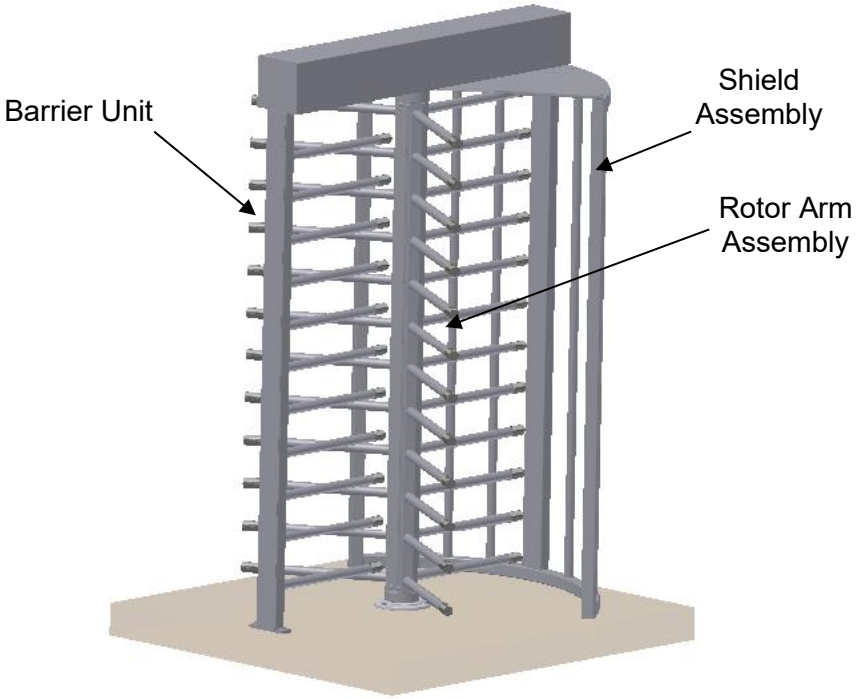
3.4 Access control system (ACS)

The Turnlock is designed to integrate with most access control systems by means of an authorization signal. When the Turnlock receives the signal from ACS, the internal control system releases the locking solenoid in the desired rotating direction.

3.5 Security

Several Security features are designed into the Turnlock unit.
The following devices are typical features found in most units.

- **Restposition**: When the rotor arms are in their respective locked rest position, they will be held tight by the force of locking pawls and ratchet assembly. This will prevent movement of the rotor arms by hand when the unit is in its locked home position.
- **Barrier Unit:** Prevents unauthorized entrance by individuals trying to tailgate in the opposite direction of a passage by an authorized user.
- **Shield Assembly:** Creates a secure compartment area where the rotor arms travel and authorized users pass.



Turnlock 100 in typical Rest Position.

3.6 Optional and Configuration Features

Items indicated by an asterisk(*) are noted as optional.

3.6.1 Rotation Detection Switch*

The optional rotational detection switch is located within the Top Channel Assembly. When an authorized user rotates the unit, this detection switch sends a dry contact closure back to the ACS to notify that the unit has been turned. The unit will then reset and wait for additional authorizations.

3.6.2 Home Position Switch *

When the Turnlock reaches its resting position, this is called the home position. A small micro-switch is activated notifying the control system that the unit is in its home position.

3.6.3 Solenoid activation switch*

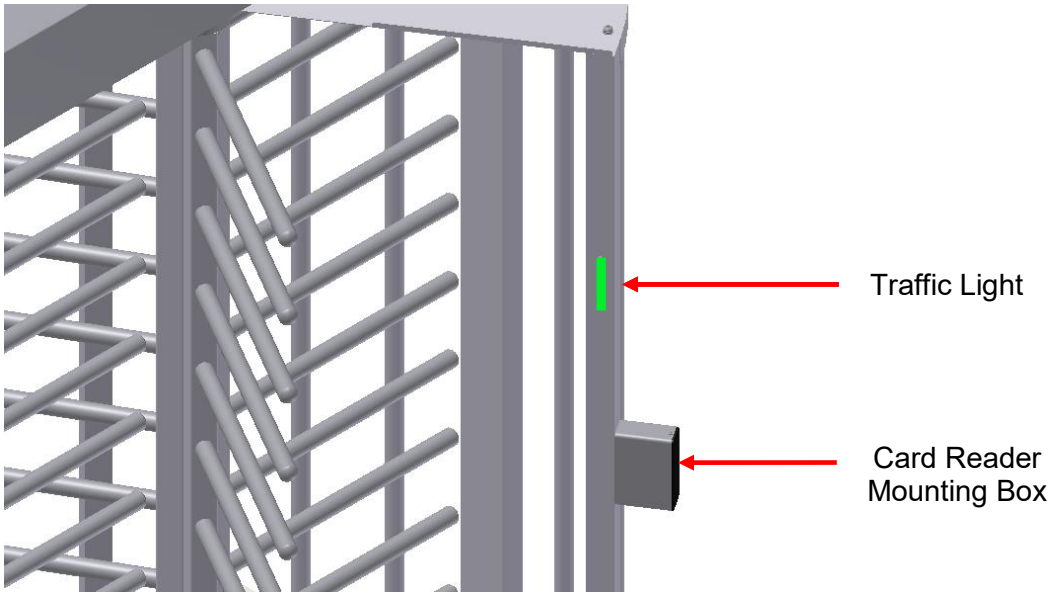
When a solenoid is activated a small micro-switch is activated notifying access control that the rotor arms are unlocked.

3.6.4 Traffic Lights*

Optional traffic lights can be installed in the end posts of the shield surrounding the walk path. The LED's illuminate Red when the unit is locked and in stand-by waiting for an authorization. When a valid card read signal is sent from the Access Control System to the Turnlock, the LED's on the respective side will turn Green.
Once a user passes through the unit, the LED's will turn back to Red.

3.6.5 Card Reader Mounting Box*

Optional Card reader mounting boxes can be provided which mount to the outer vertical post. The size of this box houses most card readers and provides adequate space for wire routing of access control systems.



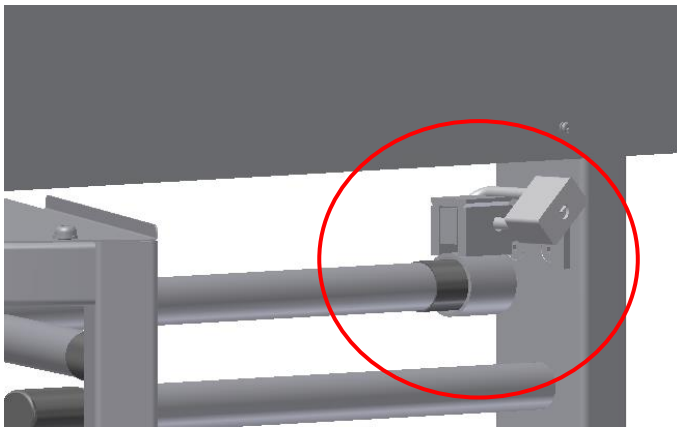
Card Reader Box and Traffic Light (Options)

3.6.6 Speed Control Dampening System*

Turnlock units are equipped with Optional Speed Control Dampening System to reduce the amount of bounce which the rotor arms can experience after a full rotation when pushed hard. The Speed Control will apply force against the rotating direction to slow the unit down for a gradual rest position (see Section 3.6 Speed Control Unit).

3.6.7 Out of Use Lock *

An optional mechanical lock can be ordered with most Turnlock units. The lock mechanism is connected to the Barrier assembly and connects/locks to the Rotor Arm preventing the unit from turning. A standard pad lock can be used to secure the mechanism (supplied by others).



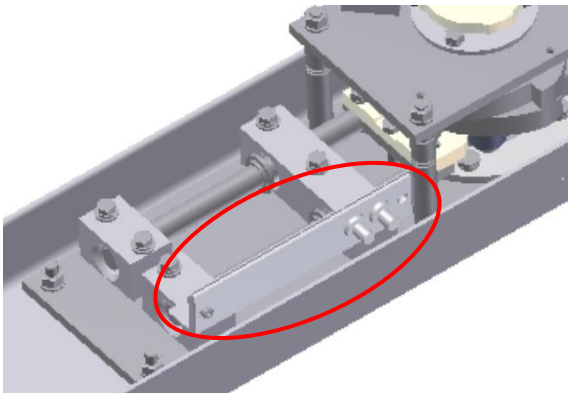
Out of Use Lock (option)

3.6.8 Heel guards*

The bottom rotor arms of the Turnlock can be fitted with an optional heel guard protector to reduce direct contact of heels with the rotor arms. If a unit is pushed against a person's foot or heel the foam rubber protector will reduce the impact.

3.6.9 Heating Element Strips*

Optional heating element strips can be ordered and applied to the internal top channel mechanism for cold climate use. Power requirements (110-220 VAC) vary depending upon the model ordered and are to be connected separately from the main control system, by others.



Heating Element Strip
(110-220VAC by others)

3.6.10 Fire alarm

For units tied into a fire alarm system, The Turnlock can be configured to work accordingly. Keep in mind that power failure functions override fire alarm functions.
The Fire Alarm inputs found inside the Main Control Box are directional, and dependent upon the configuration of the locking system (e.g., Fail Lock Exit or Fail Safe Exit).
The following configurations are available:

- Fail Lock/Fail Safe – Under Fire, it is free out, no entry
- Fail Safe/Fail Safe – Free Entry and Exit

Fail Lock: Will release when the fire alarm is activated, however, if mains power is lost, it will only open upon key-switch bypass.

In case of a fire alarm, the rotor arms will allow free passage through the barrier. The LED's will turn green for free egress in the configured direction. In case of simultaneous power failure, reference 4.4.3 for Power Failure functionality.

3.6.11 Electric Override Key Switch(es) (optional)

The secure side of the Turnlock incorporates electric override keyswitches into the back side of the shield assembly post. The keyswitches allow the owner to select functions of Card Read In/Free In or Card Out/Free Out when the respective key switch is activated.

Electric Override Key Switches

INSTALLATION

4. Installation procedure

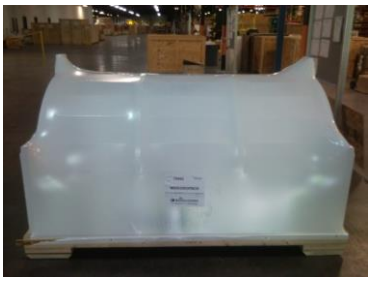
Always verify meet with the owner/owner's representative to verify the exact location and check for any unforeseen obstructions prior to installation.

	**WARNING!** Risk of personal injury or loss of life.
	**WARNING!** When working internally on the Turnlock, always be aware of moving mechanical components.
	**WARNING!** Before working on the Turnlock be sure to switch off the power supply.
	**CAUTION!** The material may be damaged or the operation of the door affected.

4.1 Packaging and Crating

Typical packaging/crating of a Turnlock unit consists of similar packaging pictured below. **Note: Tandem and Special order unit crating systems may vary**

Product Type	Crate Length	Crate Width	Crate Height	Total Weight
Turnlock EC2, ES, EA	87" (2201mm)	44"	48"	716lbs
Turnlock Round canopy	65" (1605mm)	65" (1605mm)	15" (380mm)	600lbs
Turnlock TC2 (Tandem)	103" (2602mm)	54"	46"	1600lbs



Turnlock Typical Packaging (wrapped and unwrapped)

4.2 Tool and Manpower List

Typical Turnlock installations require two men for standing and lifting materials into place. The following tools are needed for installation.

- Metric End wrench set
- Basic Metric Socket Set
- Metric Allen Wrench Set
- Precision Flat Blade Screw Driver, 1.5-4mm
- Hammer Drill with rotary hammer drill bits (3/8" (or 10 mm) for concrete anchoring)
- 4' (1220 mm) Level
- 6' (1820 mm) Ladder
- Tape Measure
- Hammer
- Utility knife
- Electrical Fish Tape (for pulling ACS and power control wires)
- Electrical Wire Stripping and Cutting Pliers.
- 4" to 6" (100 to 150 mm) Nylon Cable Ties

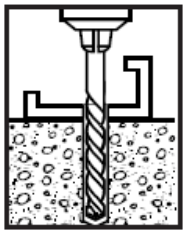
4.3 Bolt Torque Specifications

Use the following torque values for bolt connections, unless stated differently in the installation manual or mechanical drawings.

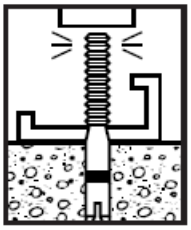
Bolt Size	Thread Size	Torque Value ft lbs	Torque value nm
M5	0.8	4.13	5.6
M6	1.0	7.1	9.6
M10	1.5	34	46.09
3/8	16	40	54.23

4.4 Anchor Techniques

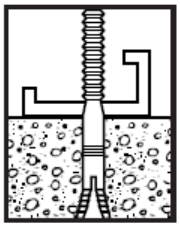
Recommends using 3/8" minimum anchor bolts supplied with the hardware kit.



1. Drill hole same diameter as anchor to be embedment



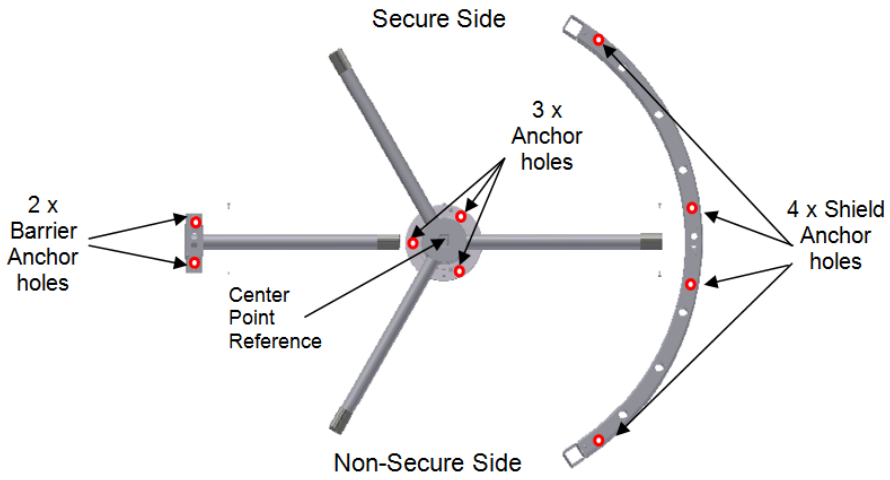
2. Drive Anchor with expander plug in bottom through material to be fastened



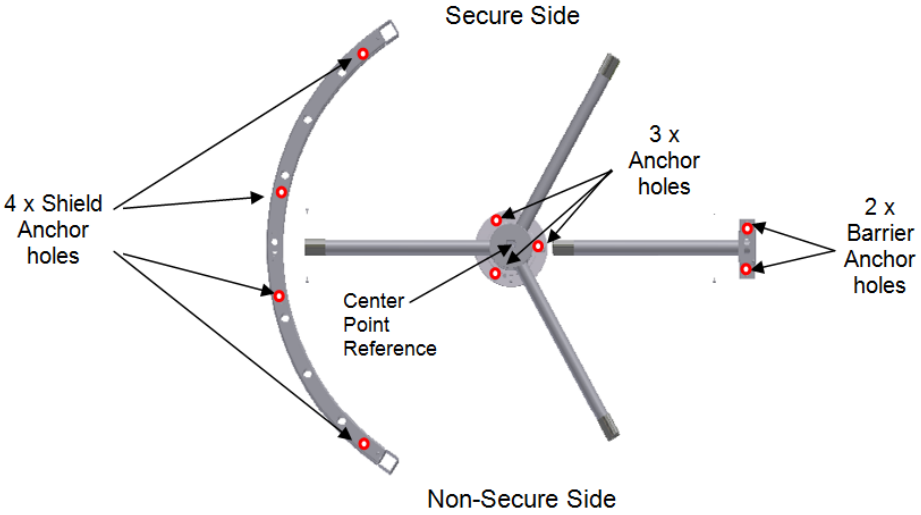
3. Expand anchor by driving anchor over plug with hammer.

4.5 Anchor Locations

The Turnlock unit is secured to the floor at several locations (Note: the Non-secure and Secure side of the turnstile, Counter-Clockwise and Clockwise rotating directions). It is important to layout the unit as illustrated for proper operation. This manual lays out the unit in a Counter Clockwise Rotation. To install in a clockwise rotation, simply reverse the anchoring layout as shown below. Anchor hardware is supplied with the installation kit containing the quantity of nuts and bolts necessary to install the unit.



Counter Clockwise Entry Installation



Clockwise Entry Installation

Typical Anchor locations and Center Point

4.6 Floor layout

4.6.1 Typical Layout*

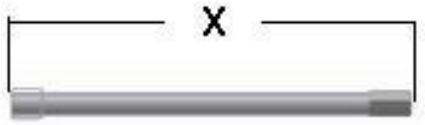
Each Turnlock product will be delivered with a two page set of drawings showing the actual dimensions necessary for layout of the unit. The center point of the unit is the best reference for laying out the unit. **Additional floor mounting templates are available upon request**.

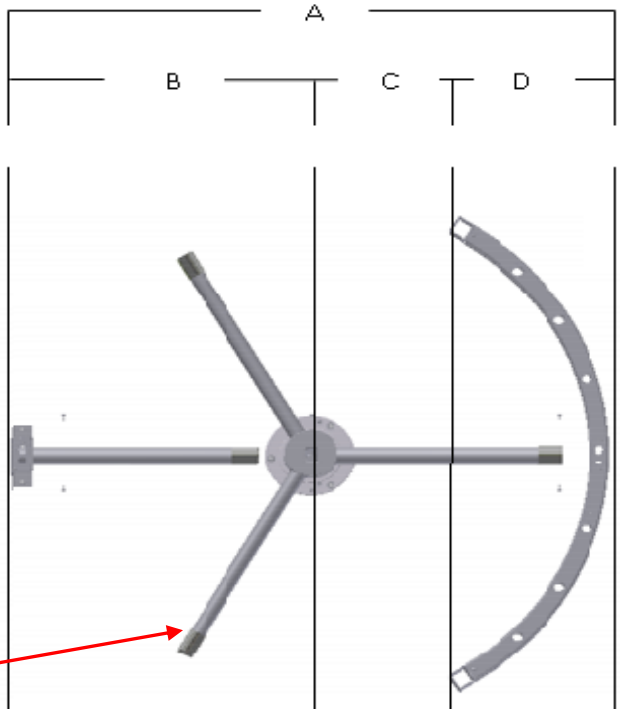
Page 2 of the product drawings will provide the dimensions of the inside radius which the Shield and Barrier Assemblies line up with. Verify how level the ground is that the Turnlock will be installed on. The more level the ground is, the better the installation will be. Verify this with a level for accuracy. The surface should be within 1/4" (6mm) level across the finished surface.

X (Rotor Arm)	A (Opening)	B (Center)	C (Arc)	D (Shield)
22 ¾"	52"	26"	9 ¾"	16 ¼"
24 ¾""	60"	30"	13 ¾"	16 ¼""
27 ¾"	66"	33"	15 5/8"	17 3/8"
30 ¾"	72"	36"	16 ¼"	19 ¾"
38 ¾"	88"	44"	18 ¾"	25 ¼"
48"	106"	52"	23"	29"

Notes:
Dimension "A" is Outside post to post dimension.

Dimension X of the Rotor Arm is from end to end of the rotor arm including the square post.





Dimension Table

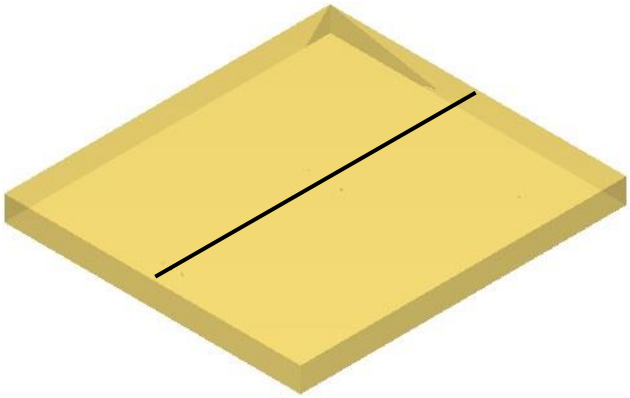
*** Typical Layout is for a Counter Clockwise rotation. For Clockwise rotating units, the dimensions shown in the Dimension Table should be mirrored.**

4.6.2 Marking for installation

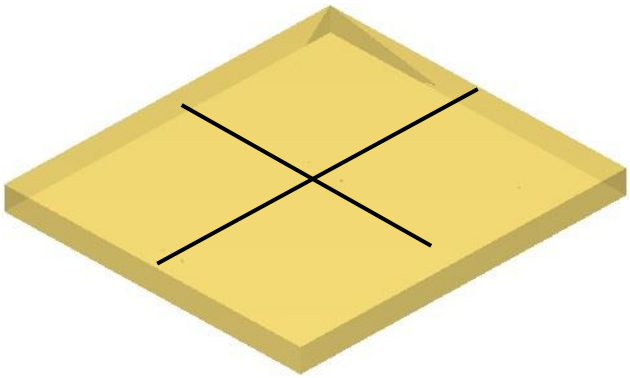
The following steps will explain the easiest way to mark the layout on the floor.

The supplied template can be used as a reference after the lines have been marked on the floor.

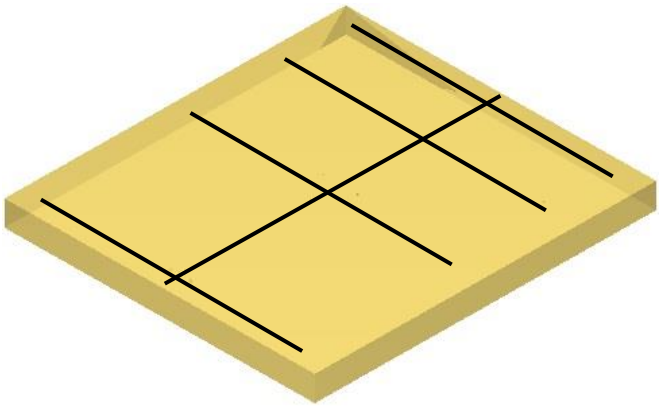
1. Mark a straight Center Line across the entire width of the opening where the Turnlock will be installed.



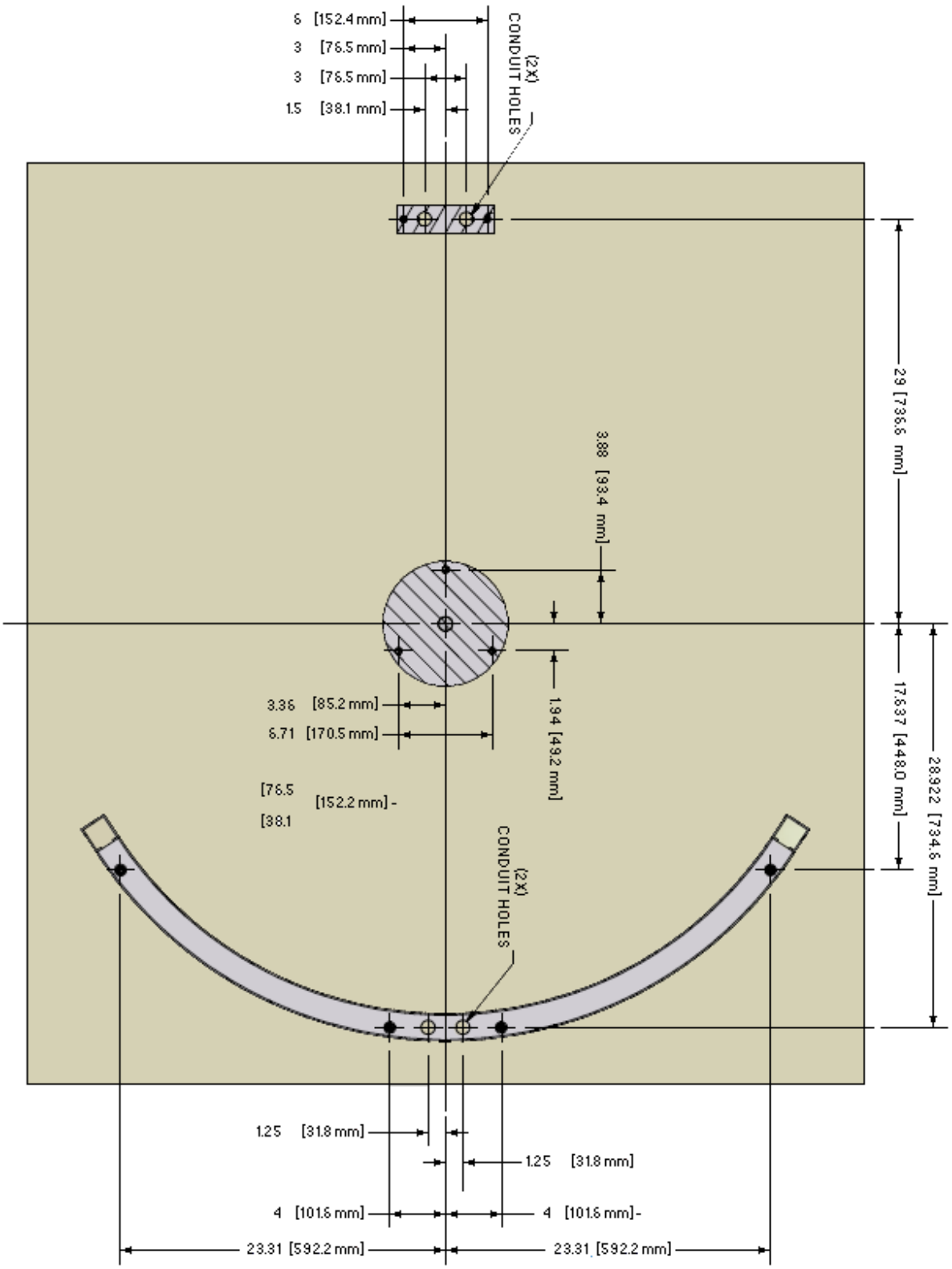
2. Find the Center Point of the opening. This is where the Base Plate (pivot point) will be mounted.



3. Using dimensions of the dimension table mark the dimensional lines where the Barrier and Shield will mount.



The layout drawing on the next page shows all dimensions and can be used as a guide.

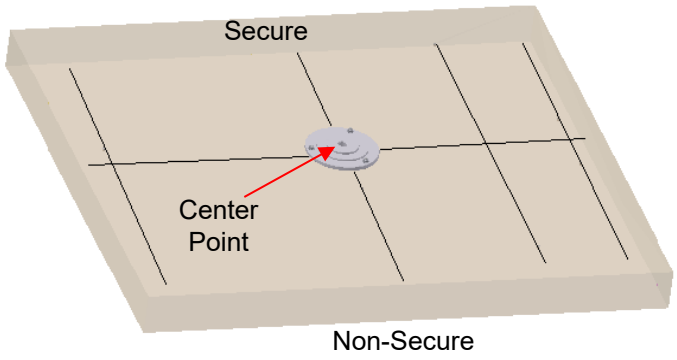

6 [152.4 mm]
3 [76.5 mm]
3 [76.5 mm]
1.5 [38.1 mm]
(2X) CONDUIT HOLES
29 [736.6 mm]
3.88 [93.4 mm]
1.94 [49.2 mm]
17.637 [448.0 mm]
28.922 [734.6 mm]
3.36 [85.2 mm]
6.71 [170.5 mm]
[76.5
[38.1
[152.2 mm]
(2X) CONDUIT HOLES
1.25 [31.8 mm]
1.25 [31.8 mm]
4 [101.6 mm]
4 [101.6 mm]
23.31 [592.2 mm]
23.31 [592.2 mm]

Dimension

4.7 Mechanical Assembly

4.7.1 Base Plate

Center the Base Plate over the Center Point Mark as shown. Mark through the Base Plate holes to the flooring. Using a hammer drill and 3/8" bit, drill holes for anchor bolts into flooring surface.

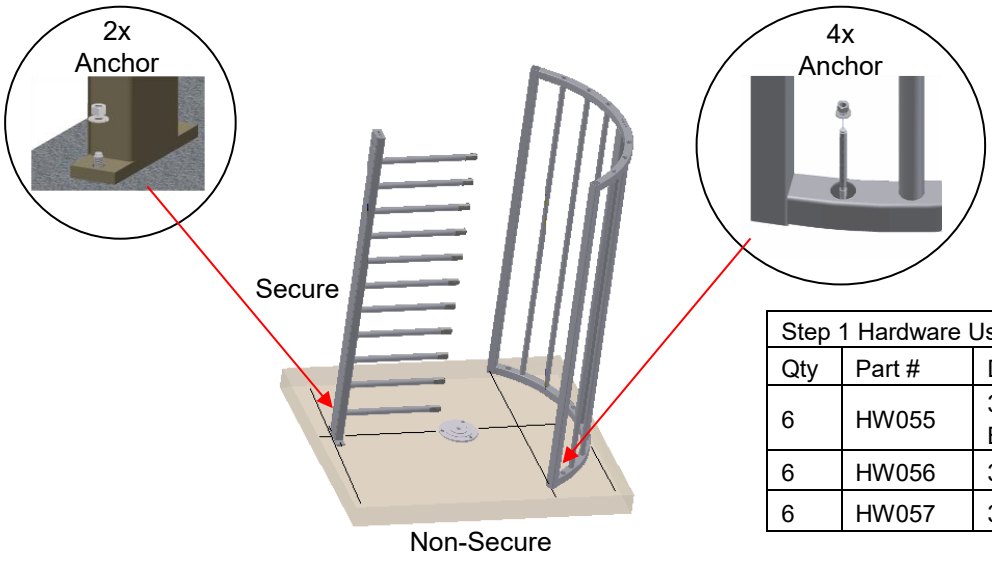


Step 1 Hardware and Parts Used in this Process		
Qty	Part #	Description
1	100-039E	Base Plate
3	HW055	3/8" Anchor Bolts
3	HW056	3/8" Flat Washer
3	HW057	3/8" Nuts

Bearing Plate

4.7.2 Shield and Barrier Assemblies

The outside edge of the shield and outside edge of the barrier assemblies layout on the floor markings with the appropriate lines as designated. Using a hammer drill, drill and anchor the 3/8" bolts at the six mounting hole locations as illustrated. Stand the barrier and shield and tighten in place as shown below using the 3/8" nuts and Flat washers.

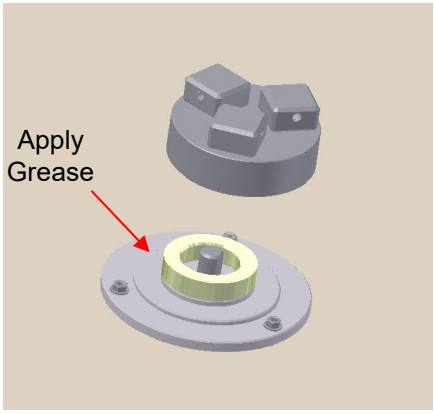


Step 1 Hardware Used in this Process		
Qty	Part #	Description
6	HW055	3/8" Red Head Anchor Bolts
6	HW056	3/8" Flat Washer
6	HW057	3/8" Nuts

Shield and Barrier Anchoring

4.7.3 Bottom Bearing and Flange Housing

Place the bottom bearing on top of the anchored base plate.
Make certain a generous coat of Grease has been applied to the bearing.
Cover with the bottom flange.

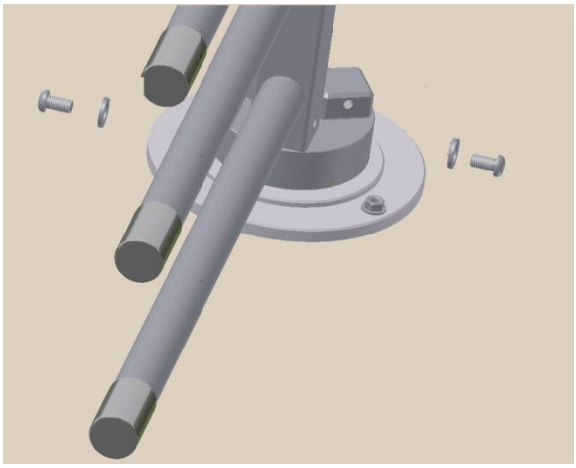


Hardware Used in this Process		
Qty	Part #	Description
1	100040	Bottom Bearing
1	Various	Bottom Flange Housing
1		Lithium Grease

Bottom Base Plate, Bearing and Flange

4.7.4 Rotor Arm Assembly

Bottom Rotor Assembly - Place a rotor arm assembly into the bottom flange pin block. Tighten with two M10 bolts and spring lock washer. A second person will be needed to hold the rotor arm in place. Repeat the process until all three rotor arms are bolted to the bottom flange housing.

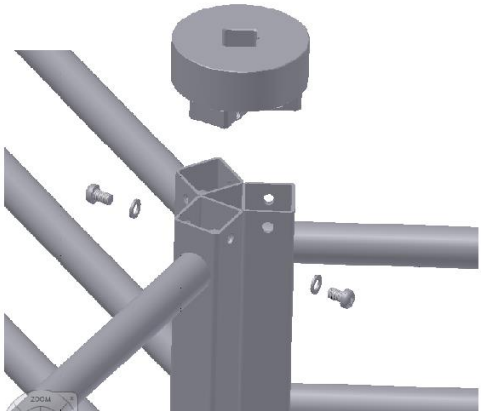


Step 2 Hardware and Parts Used in this Process		
Qty	Part #	Description
3	Various	Rotor Arm Assembly
6	HW038	M10 x 1.5 x 20 socket head
6	HW003	M10 Spring Lock Washer

Bottom Rotor Arm Assembly

4.7.5 Top Rotor Assembly

Place the upper flange blocks inside of the top of all three rotor arm posts and tighten down using M10 bolts and spring lock washers.
Note: if optional infill pieces are supplied. They must be inserted before the top channel is installed.

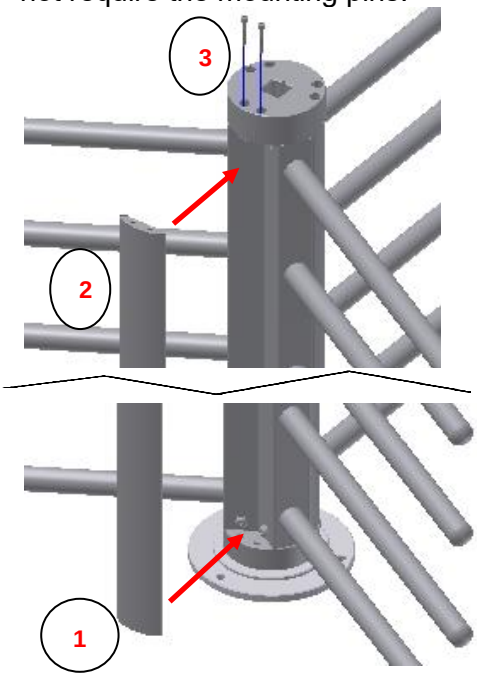


Step 2 Hardware and Parts Used in this Process		
Qty	Part #	Description
1	Varies	Upper Flange
6	HW038	M10 x 1.5 x 20 socket head
6	HW003	M10 Spring Lock Washer

Top Rotor Arm Assembly

4.7.6 Optional Rotor Infill Pieces (Powder Coat, Galvanized and Stainless models only)

If equipped with optional rotor infill pieces, the bottom of the infill piece will include pins which mount into the bottom flange first. Once the pins are inserted, move the top of the infill piece into position and then insert the pins through the top.
Note: Turnlock 250, Turnlock 200 and Turnlock 150 models use a snap in Infill pieces which do not require the mounting pins.

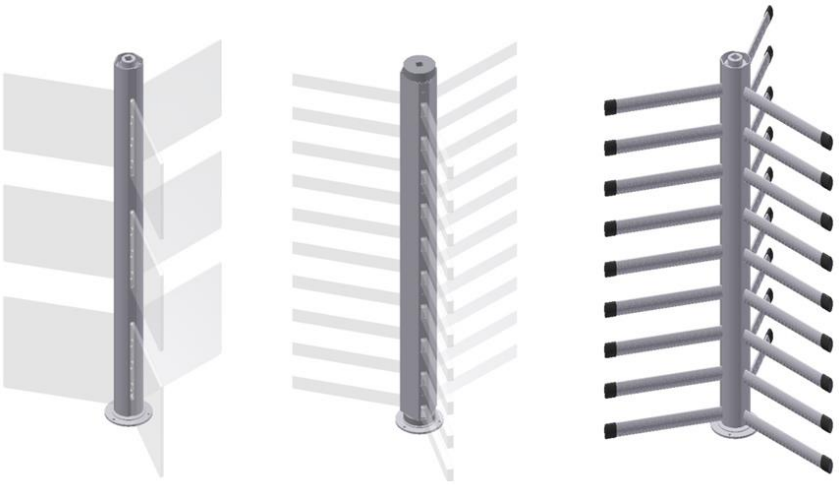


Optional Hardware Used in this Process		
Qty	Part #	Description
3	Varies	Infill Pieces
6		M6 x 40 socket head

Optional Rotor Infill Pieces

4.7.7 Turnlock 150, 200 and 250 Rotor Arm Assembly (Option)

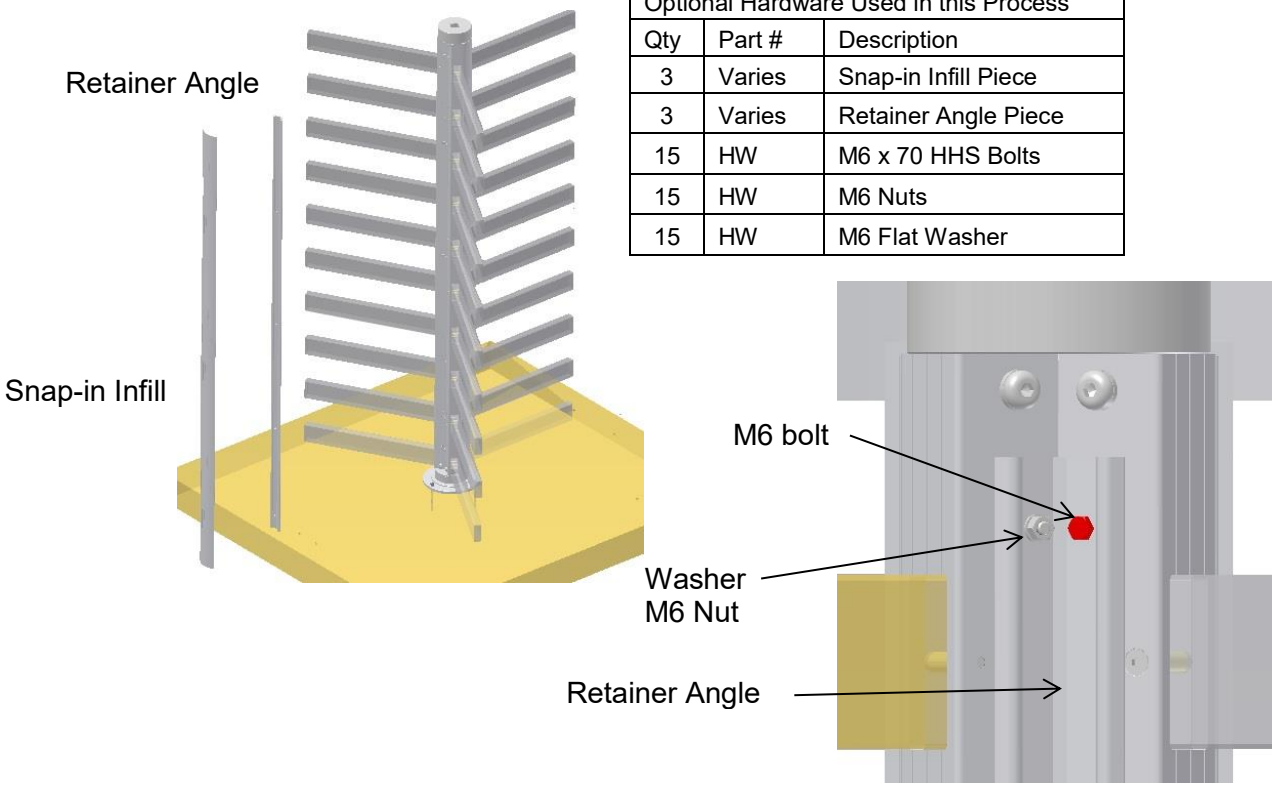
The rotor arms of the Turnlock 250, Turnlock 200 and Turnlock 150 units assemble in the same manner as the standard Turnlock rotor arms and always include a two piece standard snap-in style infill.



Optional Rotor Arms, (Turnlock 250, Turnlock 200 and Turnlock 150)

After the rotor arms are connected to the Top and Bottom Hus assemblies, connect the retainer andgle to the rotor armes using the M6 x 70 bolts, lock washers and flat washers as shown.

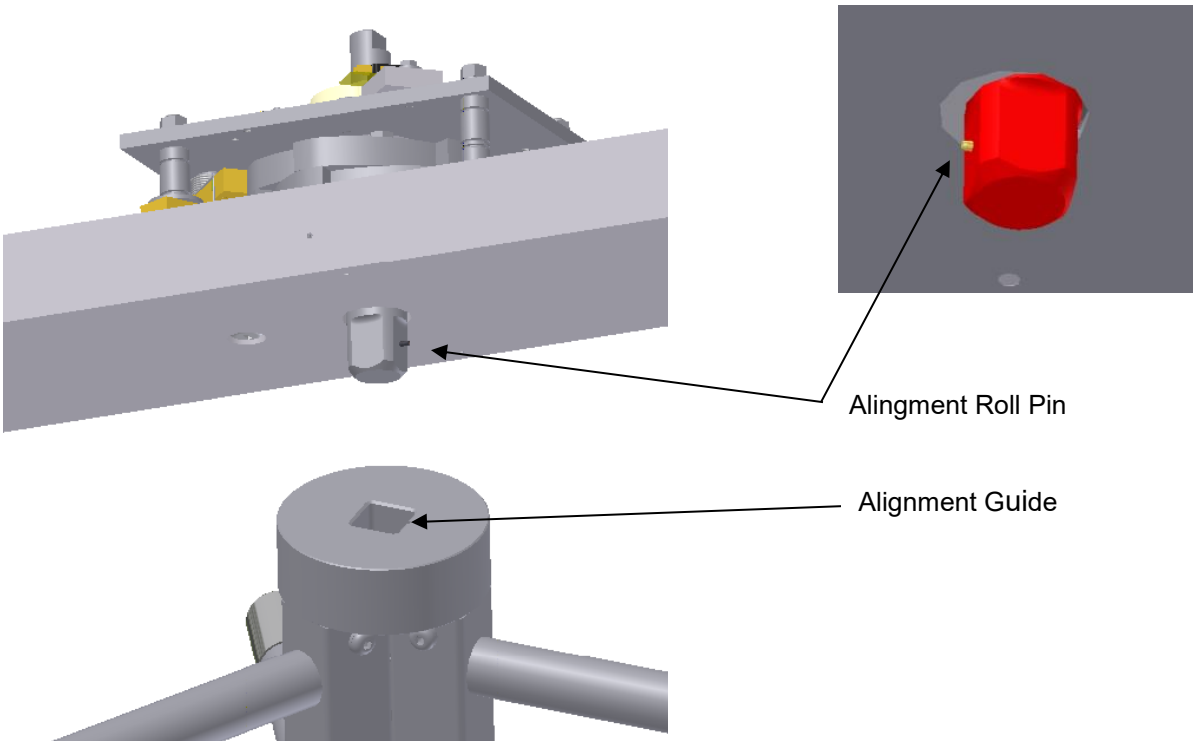
Optional Hardware Used in this Process		
Qty	Part #	Description
3	Varies	Snap-in Infill Piece
3	Varies	Retainer Angle Piece
15	HW	M6 x 70 HHS Bolts
15	HW	M6 Nuts
15	HW	M6 Flat Washer



Rotor Arm Snap-in Infill

4.8 Top Channel Direction Alignment

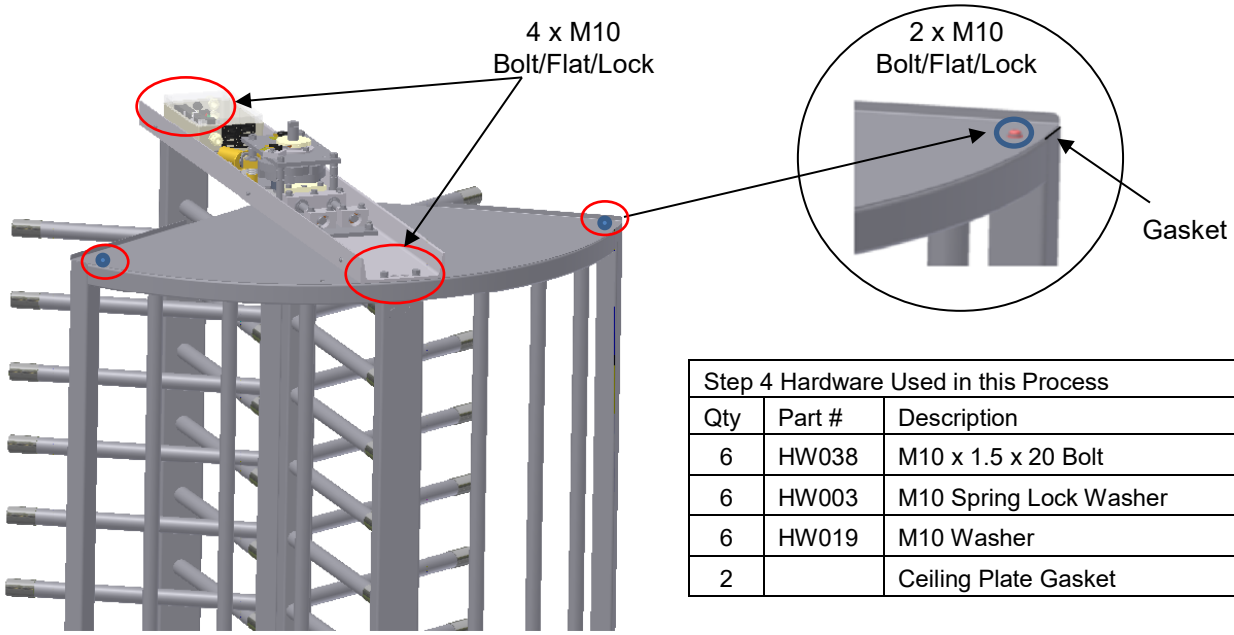
When setting the top channel on top of the ceiling plate, shield, and barrier post, it is necessary to verify that the top channel is positioned properly. An alignment roll pin in the top channel assembly shaft should set into the alignment guide of the top flange assembly.
Check the position of the pin and, if needed, rotate the rotor assembly to line then both up. Alignment of these components will assure the proper resting position of the unit.



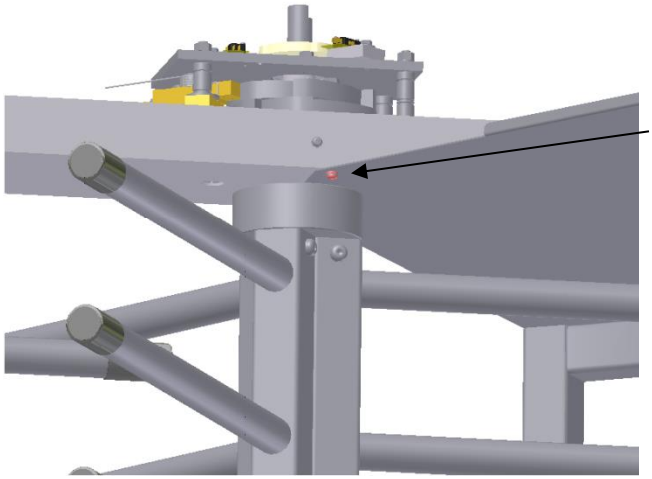
Top Rotor Arm Assembly

4.9 Ceiling Plate and Top Channel Connection

The ceiling plate mounts to the top of the shield assembly. Gaskets fit between the ceiling plate and each endpost. Three M10 bolts connect the ceiling plate to the shield assembly. Four M10 bolts, lock washers and flat washers connect the top channel to the mid-post of the shield and barrier post (Note: Tandem units and dual shield units will use three extra M10 bolts to connect the second shield and ceiling plate).



Step 4 Hardware Used in this Process		
Qty	Part #	Description
6	HW038	M10 x 1.5 x 20 Bolt
6	HW003	M10 Spring Lock Washer
6	HW019	M10 Washer
2		Ceiling Plate Gasket

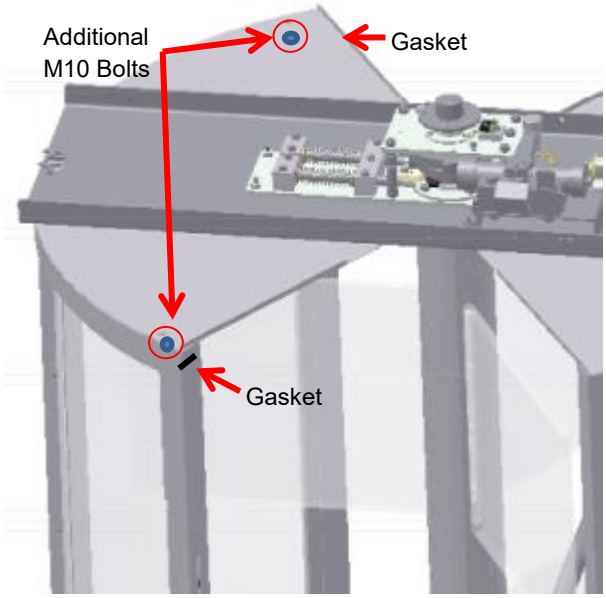


Step 4 Hardware Used in this Process		
Qty	Part #	Description
2	HW001	M5 x 8 Button Head
2	HW016	M5 Spring Lock Washer

Top Channel and Ceiling Plate Bolt Connections

4.10 Dual Ceiling Plate Option - Ceiling Plate Retainer

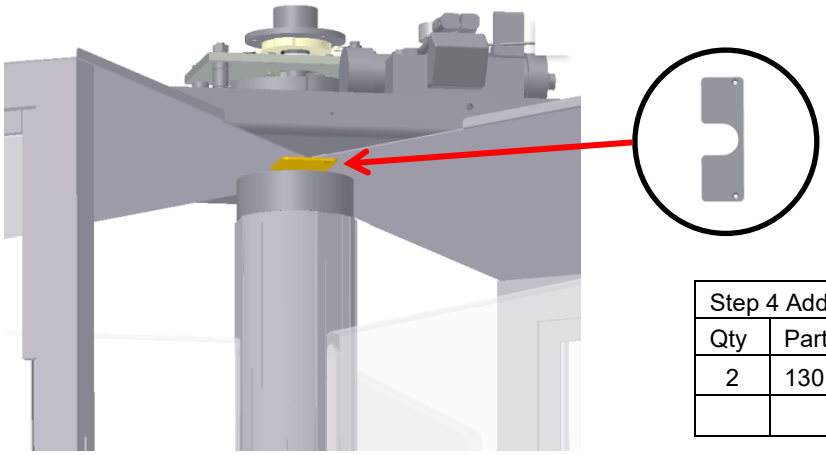
Dual shield and ceiling plate units connect in the same manner as a standard ceiling plate. Two additional M10 bolts washers and lock washers are used to connect the ends of the additional dual ceiling plate. Two additional gaskets are placed under the endpost corners of the shield.



Step 4 Additional Hardware Used in this Process		
Qty	Part #	Description
2	HW038	M10 x 1.5 x 20 Bolt
2	HW003	M10 Spring Lock Washer
2	HW019	M10 Washer
2		Ceiling Plate Gasket

Dual Shield Connection

The bottom side of the Dual Ceiling Plates are mended together using a Ceiling Plate Retainer and the existing hardware as shown. The pressure from the retainer holds the additional ceiling plate in position.

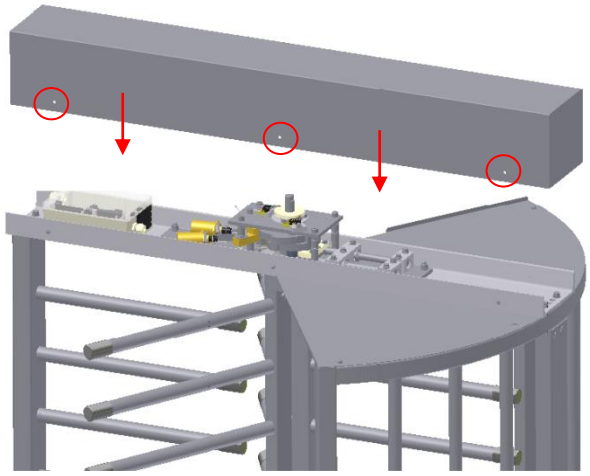


Step 4 Additional Hardware Used in this Process		
Qty	Part #	Description
2	13010	Ceiling Plate Retainer

Dual Shield Ceiling Plate Retainer

4.11 Top Channel Cover

The standard cover fits over the top channel and mechanism.
It is connected by six M5 bolts and flat washers.
Note: See section 5.6 before securing the top channel cover. It is necessary to connect electrical power, access control and check the operation of the mechanism.



Top Channel and Ceiling Plate Connections

Step 6 Hardware Used in this Process		
Qty	Part #	Description
6	HW054	M5x0.8 x 13 Bolt
6	HW020	M5 Washer

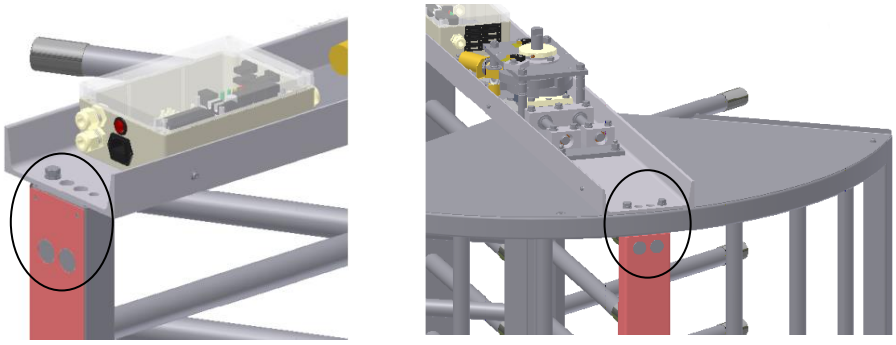
5. Electrical installation

The requirements for the mains power supply are:

- Power supply: 110-240 VAC, 50/60 Hz (**Verify correct Voltage with your order**)
- Internal Fuse of MCB: 15A
- Recommended Breaker: 20 amp single pole (110VAC), Double pole (<200VAC).
- Refer to the electrical drawings (E-drawings) for more detailed information.

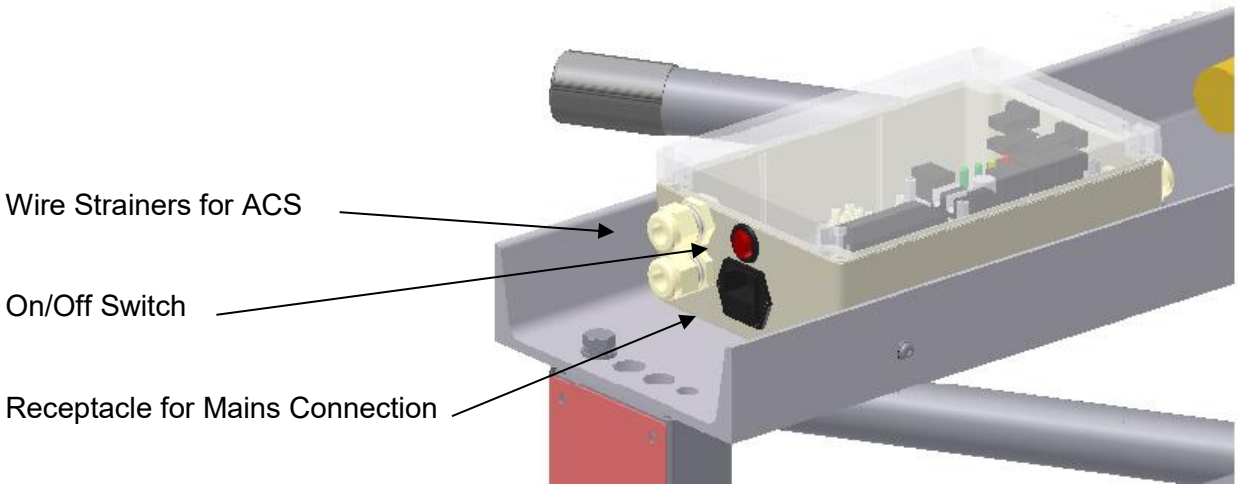
5.1 Mains Electrical Connection

Electrical service conduit holes are designed into both mid-posts of the Turnlock. There are two holes on each side for running mains power, access control, fire alarm or other necessary communications to the unit. The Endposts and Midpost and Barrier post also function as a conduit for channeling electrical wires from the ground up into the control box.



Conduit Holes

A standard electrical cable is supplied with the unit which connects to the control box. Connect in accordance with local electrical code requirements. The following components are included for connection of the controls to the building system:

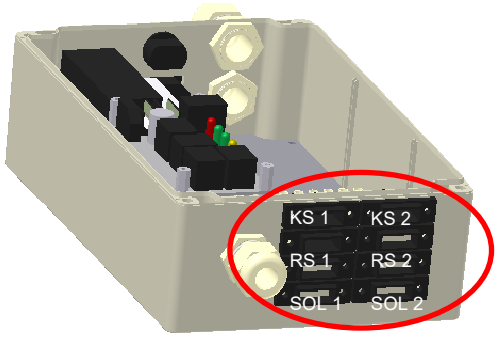


Main Control Box

5.2 Main Control Box

5.2.1 Cable Connections

There are many cables which connect to the Main Control Box. The following cable plugs are typical on the Turnlock:



Factory Connected :

- KS 1 and 2 – Key Switch
- RS 1 and 2 – Reset Switch
- Sol 1 and 2 – Solenoids

To be connected in Field:

- LED 1 and 2 – Endpost Lights

Cable Plug Layout of Main Control Box

5.2.2 Cable Descriptions

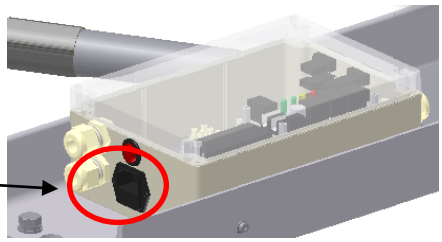
The following table lists all cables and connecting terminations points of the control box and the device in the Turnlock.

		Connection Point	
Part Number	**Description**	**Control Box**	**Device End**
10909	Reset Switch 1 Cable	RS 1	Reset Switch (ACW direction)
10910	Reset Switch 2 Cable	RS 2	Reset Switch (CW direction)
10911	Keyswitch Assembly 1 Cable	KS 1	Key-switch (Non-Secure) ACW rotation
10912	LED 1 Cable	LED 1	LED 1 (Non-Secure Side)
10913	LED 2 Cable	LED 2	LED 2 (Secure Side)
10914	Solenoid Activation Switch 1 Cable	SOL 1	Solenoid (Non-Secure activation side
10915	Solenoid Activation Switch 2 Cable	SOL 2	Solenoid (Secure activation side)
10916	Keyswitch Assembly 2 Cable	KS 2	Key-switch (Secure Side) CW rotation
10917	Rotation Detection Switch 1 Cable	Optional	Rotation Detection Micro-switch ACW direction
10918	Rotation Detection Switch 2 Cable	Optional	Rotation Detection Micro-switch CW direction
10919	Home Position Switch Cable	Optional	Home Position Micro-switch

5.2.3 Electrical Fusing

For 110/220 VAC single phase Mains Power, a 2.5 Amp fuse is located inside the Mains Power Receptacle as shown. An integrated fuse holder is located in the lower portion of the receptacle.

Receptacle with Fuse Holder

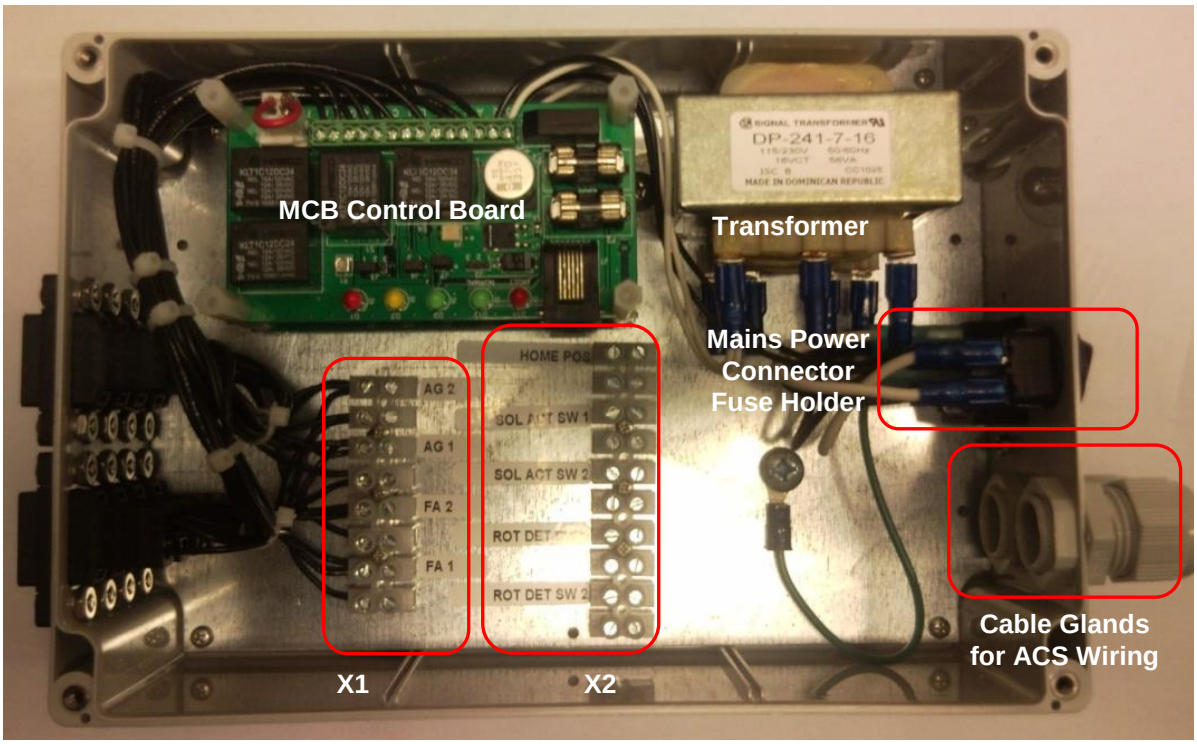


Mains Power Receptacle

Units using dual phase 220 VAC, requires an additional factory supplied fuse located inside the control box. Reference electrical drawings in the appendix for additional information.

5.2.4 Access Control Integration

The Access Control System (ACS) connections are terminated to the X1 and X2 terminal strips located inside the main control box. The following integration connections are available:



Main Control Box

5.2.5 Terminal Strips

X1 Terminal Strip

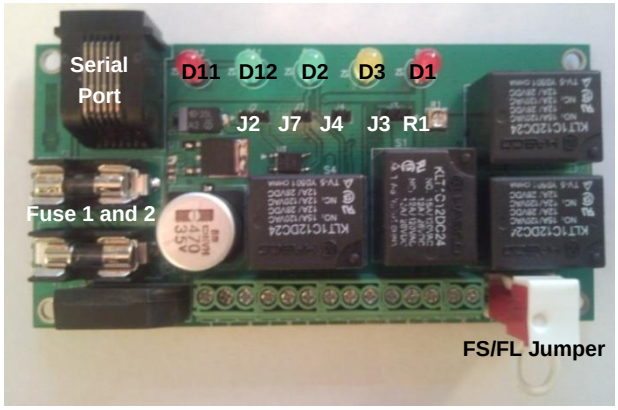
- AG2 - Access Grant CW
- AG1 - Access Grant ACW
- FA 2 - Fire Alarm CW
- FA 1 - Fire Alarm ACW

X2 Terminal Strip

- HOME POS - Home Position
- SOL ACT SW1 - Solenoid Activation Switch 1
- SOL ACT SW2 - Solenoiod Activation Switch 2
- ROT DET SW 1 - Rotation Detection Switch ACW
- ROT DET SW 2 - Rotation Detection Switch CW

1.1 Configuration

A series of jumpers are pre-configured on the main control board(s) specific to each configuration (i.e., Fail Safe/Fail Lock). Each board is configured for a single direction of travel:



MCB Detail

Board Layout

- Jumpers - J2, J3, J4, J7 (reference Jumper Configuration Chart for specific settings).
- R1 – Potentiometer to adjust time out duration.
- Staus LEDs
  - D11 – Fault Condition Indicator
  - D12 – Normal Operation Indicator
  - D1 – Lock Activated
  - D2 – Pulse Trigger
  - D3 – Pulse Relay
- Fail Safe/Fail Lock Jumper
- Fuses – 1.5 Amp
- Serial Port Interface

Factory Default Settings →

JUMPER CONFIGURATIONS				
FUNCTION	PINS TO JUMP ON JUMPER:			
	J2	J3	J4	J7
NO PULSE OR TIME OUT CIRCUIT	2 - 3	2 - 3	--	--
TIME OUT CIRCUIT ONLY	2 - 3	1 - 2	--	--
PULSE CIRCUIT ONLY	--	2 - 3	1 - 2	1 - 2
PULSE AND TIME OUT CIRCUITS	--	1 - 2	1 - 2	1 - 2
SERIAL PORT INTERFACE WITHOUT TIMEOUT	--	2 - 3	--	--
SERIAL PORT INTERFACE WITH TIMEOUT	--	1 - 2	--	--

Jumper Configuration Chart

Configuration Definitions:

- Time Out Relay:
  Provides a time out duration after a valid access is granted.
  The setting of potiometer R1 determines the holding duration of this relay.
  After the hold time expires the unit will return to its standby state.
- Pulse Relay:
  When the Access Control System sends an access grant signal to the MCB, a one-shot pulse will automatically generate internally; regardless of how long the ACS input signal is held.
- Serial Port Interface
  Allows the MCB to react to wet voltages (3-25vdc) instead of dry contact inputs on the X1 terminals. Options for signal transmission TD or SD (Transmit Data), DTR (Data Terminal Ready), RTS (Request to Send Data).

1.2 Start-up

	**WARNING!** Persons should remain clear of the Turnlock top channel mechanism's moving parts.

1.2.1 General

The Turnlock will be pre-configured is ready for general use after proper installation. Setting up the Turnlock for operation can be accomplished by using the start procedure as described below.

- Rotate the unit to its proper resting position.
- Turn power to the main control box on.
  The solenoids should engage and you will hear the lock(s) pull in.
- Green LED on MCB indicates unit is ready for operation.
- At this point, the unit is ready for operation.

1.2.2 Time Out Relay Adjustment

Turnlock units are equipped with a time out relay preset at the factory for approximately 10 second time out delay after a valid card read.

To adjust this setting carefully turn the potentiometer clockwise to minimize this time (approx seven seconds), or counter-clockwise to increase this setting (max time approx 20 seconds).

1.2.3 Speed Control Adjustment (Optional)

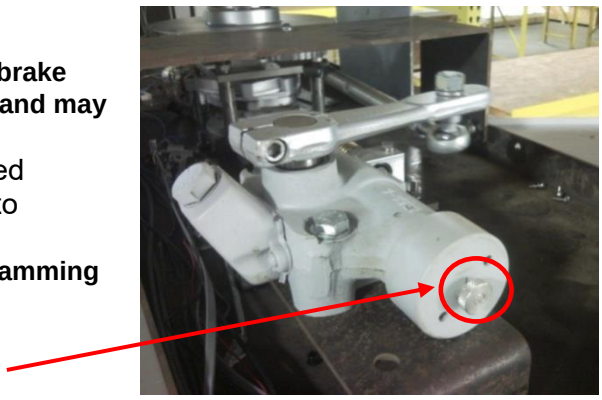
The Turnlock speed control system are set during factory assembly but may require additional field adjustment to achieve the desired dampening during position cycle.
The following procedure can assist in finalizing this setting.

- Rotate the unit until you can feel the dampening system take effect (If dampening does not take effect, the rotor arms will slam against the locking mechanism).
- If more dampening is necessary, turn the speed control adjustment wheel clockwise to increase the resistance of the dampening mechanism until the desired force is applied.

Note: too much dampening can cause the unit to brake too early which affects the throughput of the unit and may damage the equipment.

- If less dampening is necessary, turn the speed control adjustment wheel counter-clockwise to decrease the amount of dampening.

Note: too little dampening can result in the unit slamming against the locking system and may damage the equipment.

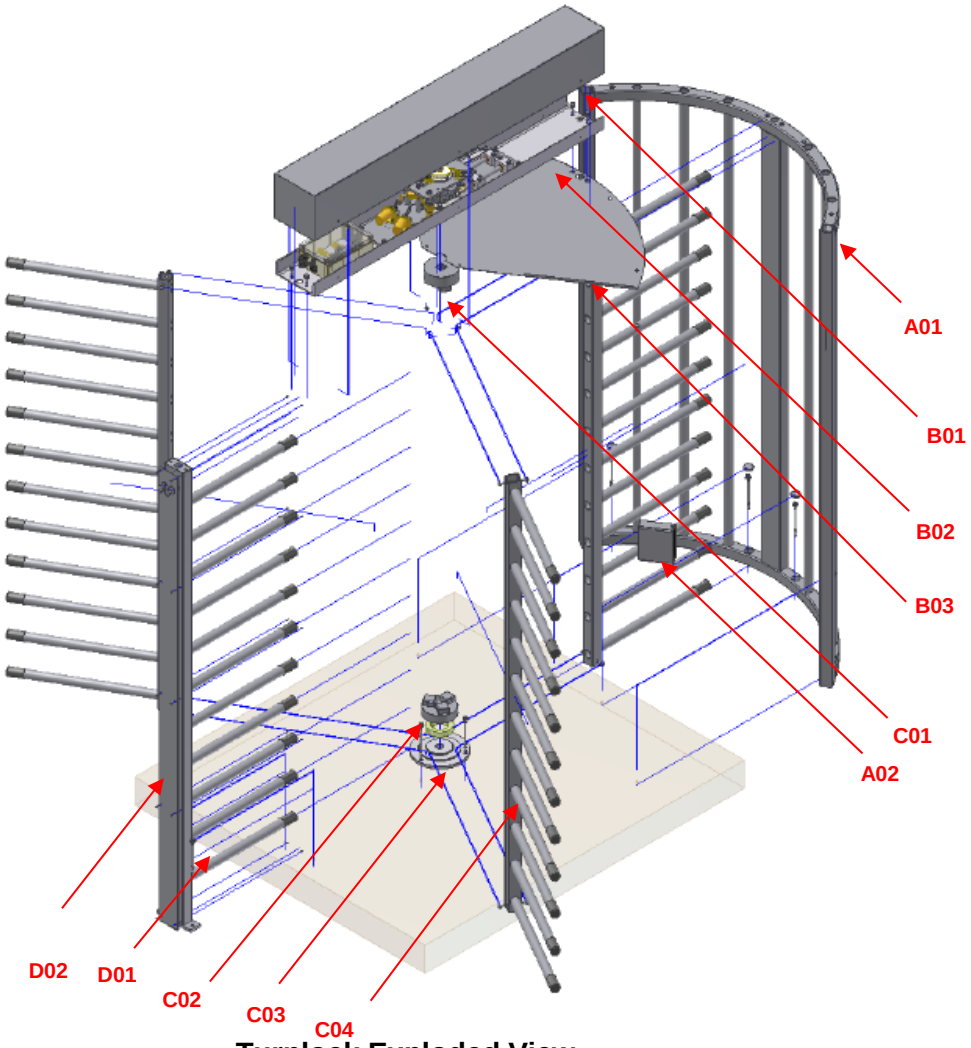


Adjustment Wheel

Speed Control

2 Parts Overview

2.1 Turnlock- Exploded View



Turnlock Exploded View

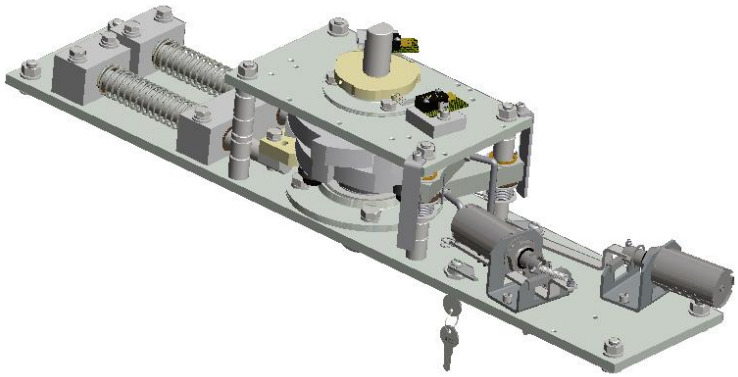
Part Description	
A01	Side Shield
A02	Card Reader Bracket (Optional)
B01	Top Channel Cover
B02	Top Channel Mechanism
B03	Ceiling Plate
C01	Top Flange Assembly
C02	Bottom Flange Assembly
C03	Base Plate Assembly (w/Bearing)
C04	Rotor Arm Assembly (3 Each)
D01	Barrier Assembly
D02	Barrier Post Cover

Turnlock 100 Parts Description

Field configurable top channel

3 General

The Turnlock field configurable top channel gives freedom of changing the set-up on the job site in a couple of minutes.



3.1 Change possibilities.

There are 15 different configurations that can be changed in the field.

Some changes in the configuration will need additional parts.

All possible configurations are shown in the figure below.

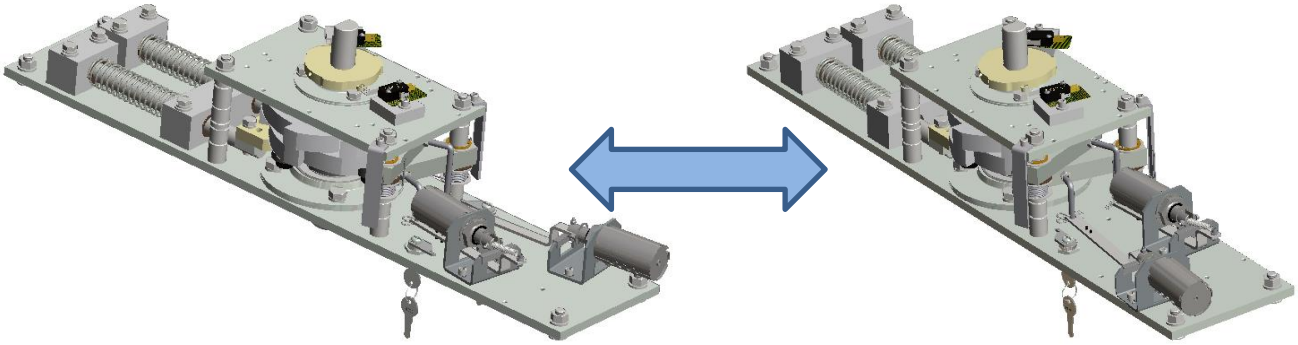
If the configuration is changed from a Mechanical lock to an Electrical lock additional parts will be needed.

	Non secure	Secure
1	Mechanical Fail lock	Mechanical Fail safe
2	Mechanical Fail safe	Mechanical Fail lock
3	Mechanical Fail safe	Mechanical Fail safe
4	Electrical Fail lock	Mechanical Fail lock
5	Electrical Fail lock	Mechanical Fail safe
6	Electrical Fail safe	Mechanical Fail lock
7	Electrical Fail safe	Mechanical Fail safe
8	Mechanical Fail lock	Electrical Fail lock
9	Mechanical Fail lock	Electrical Fail safe
10	Mechanical Fail safe	Electrical Fail lock
11	Mechanical Fail safe	Electrical Fail safe
12	Electrical Fail lock	Electrical Fail lock
13	Electrical Fail lock	Electrical Fail safe
14	Electrical Fail safe	Electrical Fail lock
15	Electrical Fail safe	Electrical Fail safe

3.2 Common changes

3.2.1 Direction change

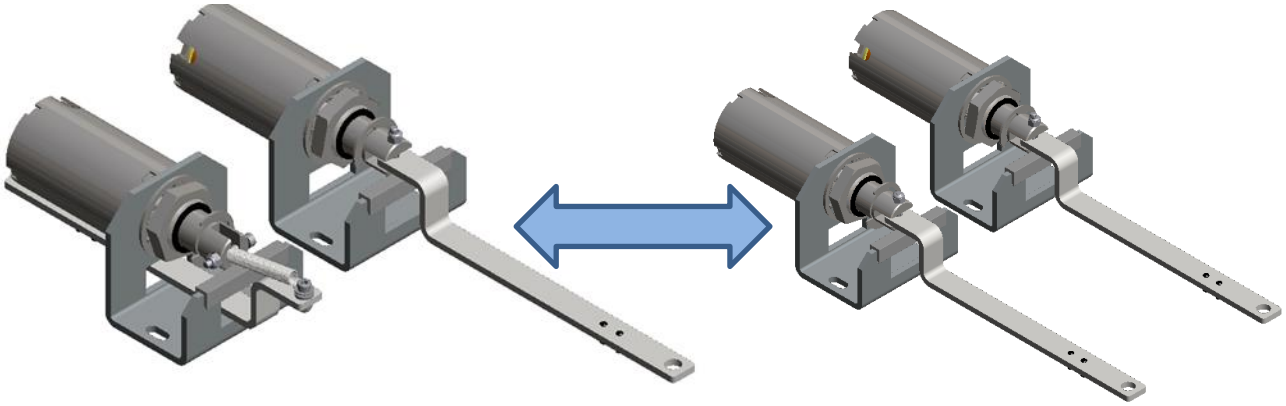
Changing the Fail – lock and Fail – safe direction.



Electical Fail - lock / Electical Fail - safe ⟺ Electical Fail - safe / Electical Fail – lock

3.2.2 Function change

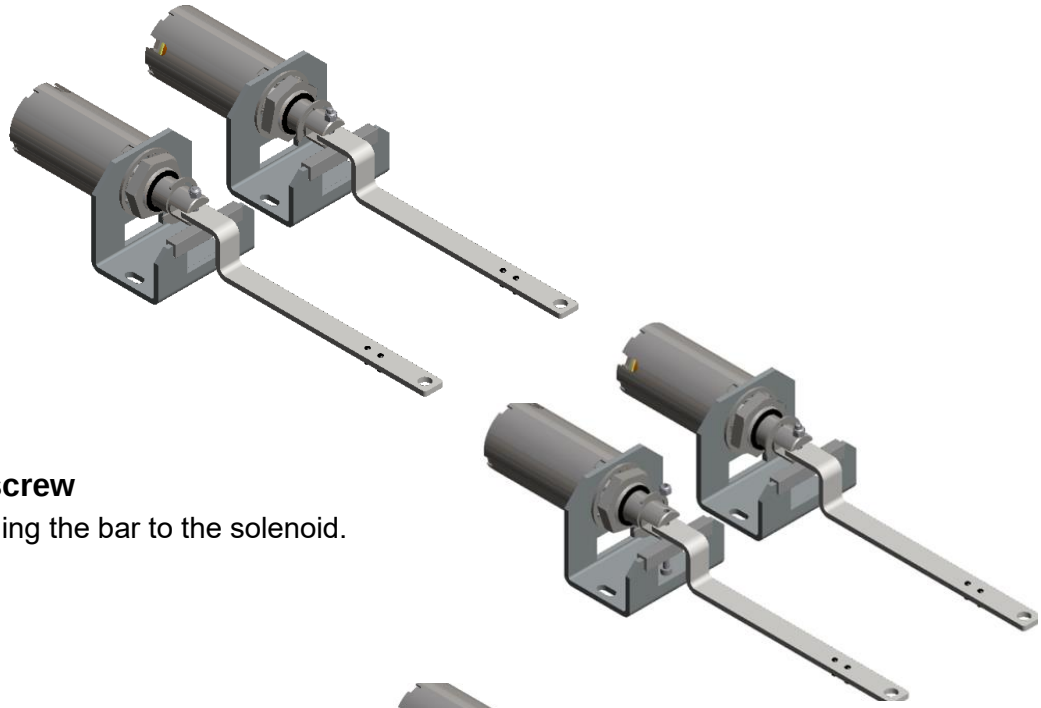
Change the function of the lock from Fail – lock to Fail – safe or the other way around.



3.3 Changing the lock configuration.

The locks can be changed in the field from a fail lock to a fail-safe configuration or the other way around.
The Turnlock drive is always supplied with additional hardware that will be needed.

3.3.1 Fail lock to fail safe.

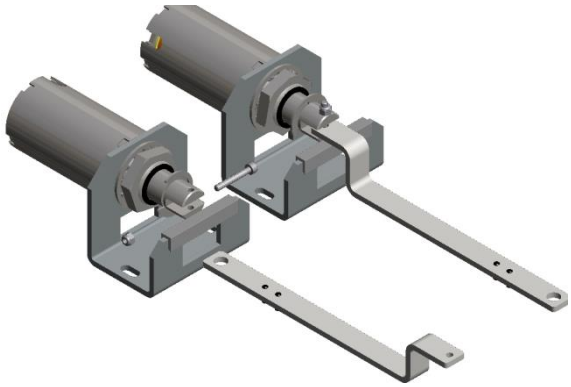


3.3.2 Remove screw

Remove the screw holding the bar to the solenoid.

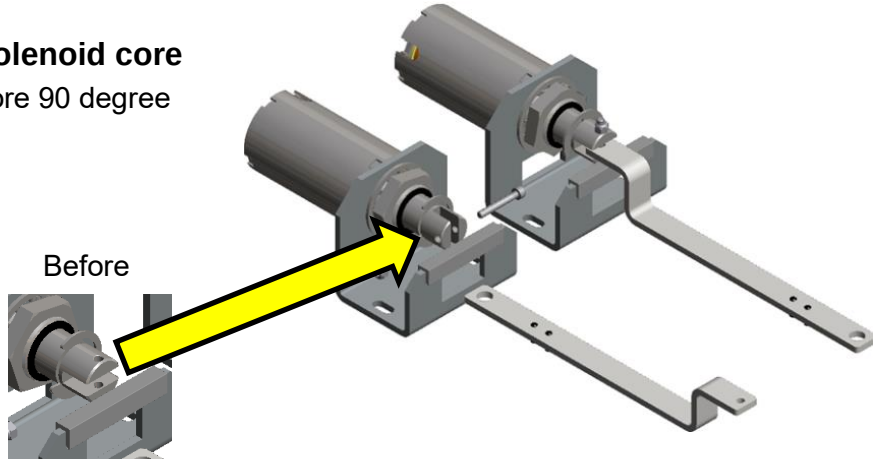
3.3.3 Turn the bar

Take the bar out and turn it around



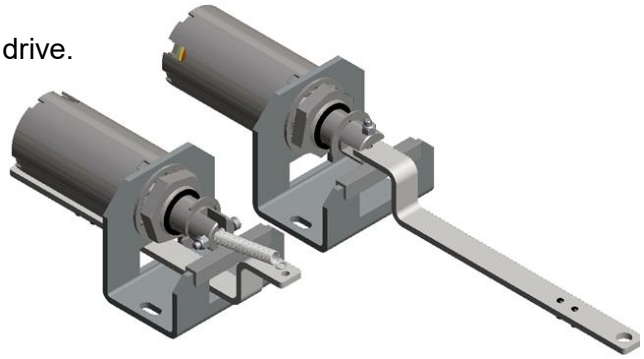
3.3.4 Turn solenoid core

Turn the solenoid core 90 degree



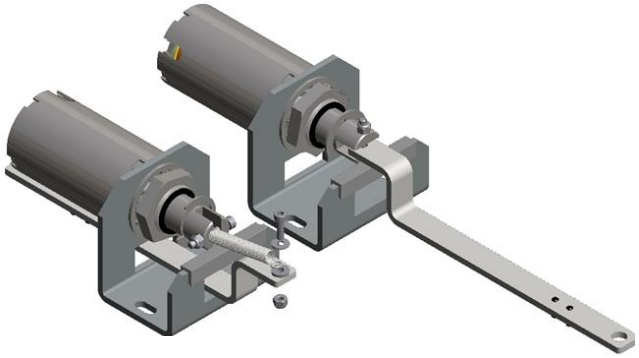
3.3.1 Install spring

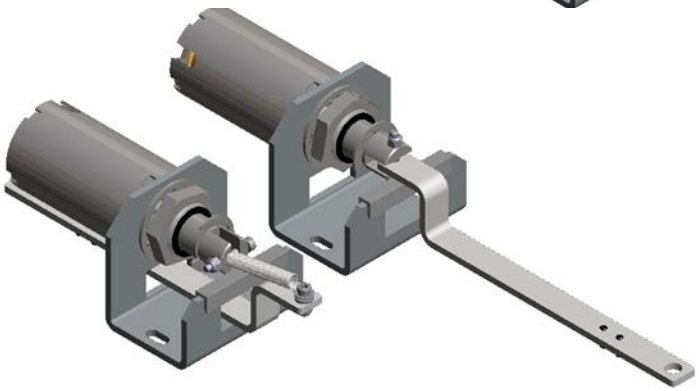
Slide the bar in under the solenoid.
Install the spring, these are supplied loose with the drive.



3.3.2 Connect spring to bar

Connect the spring to the bar.
Two washers under the spring and one on top



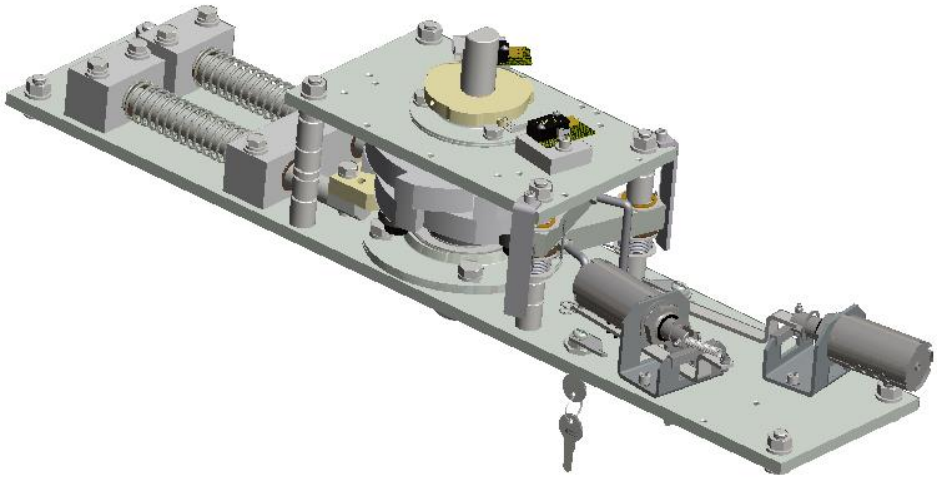


Please see Electrical connections for changes that need to be made in the control-box

3.4 Changing the top channel

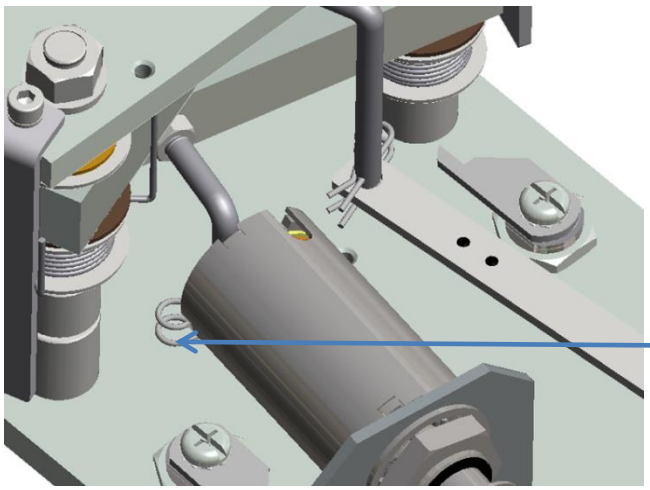
In some cases it is necessary to change the configuration of the top channel.
If both locks are fail safe and one direction needs to be fail lock, please see the previous chapter first to change one of the locks.

3.4.1 From Fail safe – Fail secure to Fail secure – Fail safe

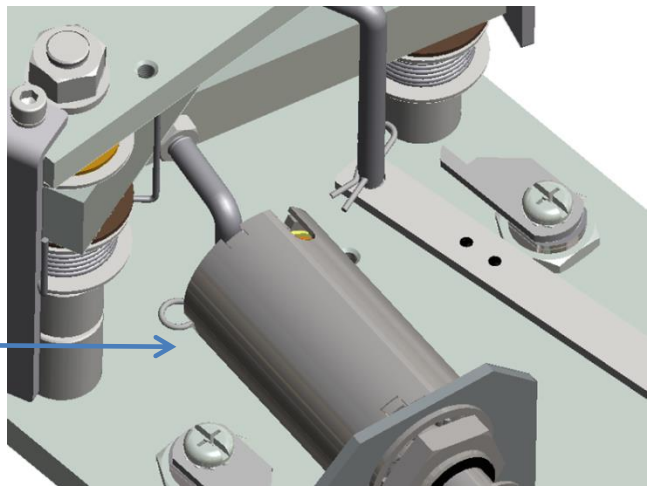


3.4.2 Remove bottom pins

Remove the bottom pins that hold the bar in place.



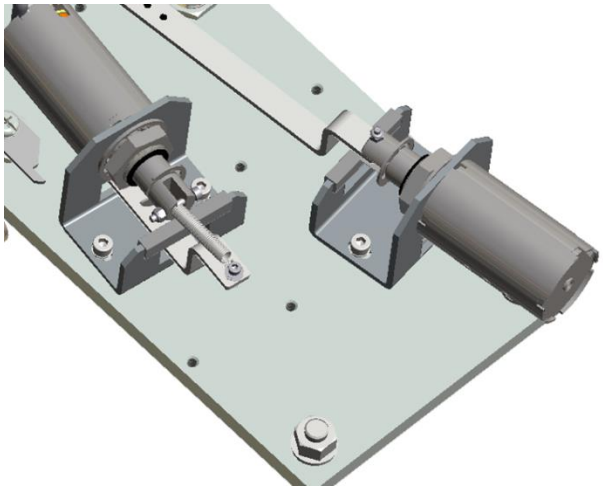
Bottom pins in place



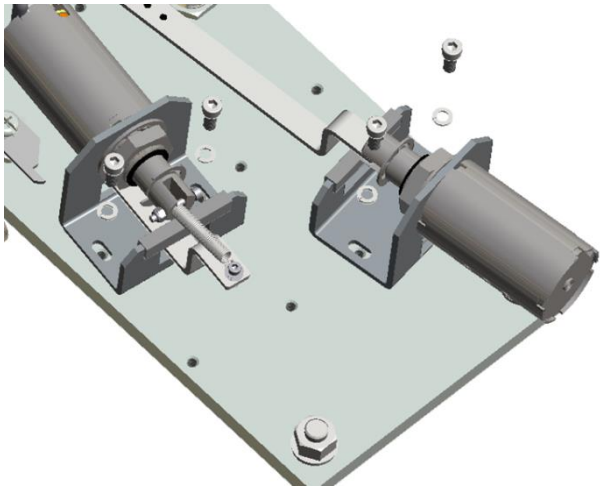
Bottom pins removed

3.4.3 Remove bolts

Remove the bolts that hold the solenoids in place.

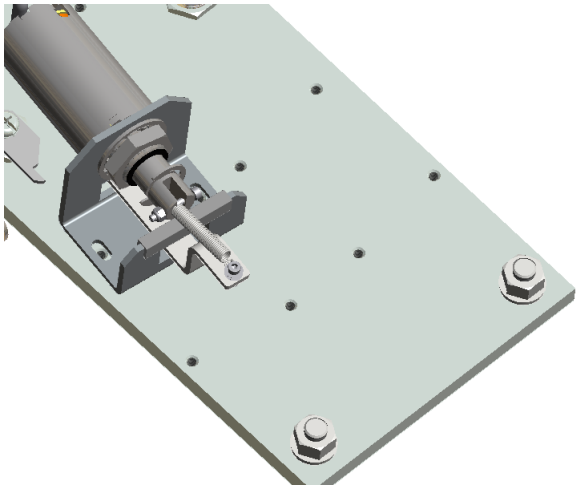


Bolts in place

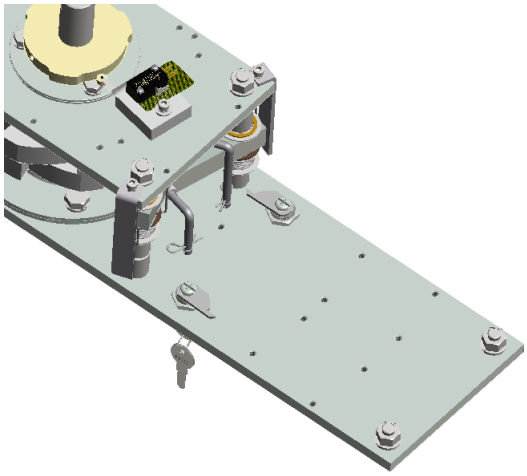


Bolts removed

3.4.4 Remove solenoids



First solenoid removed

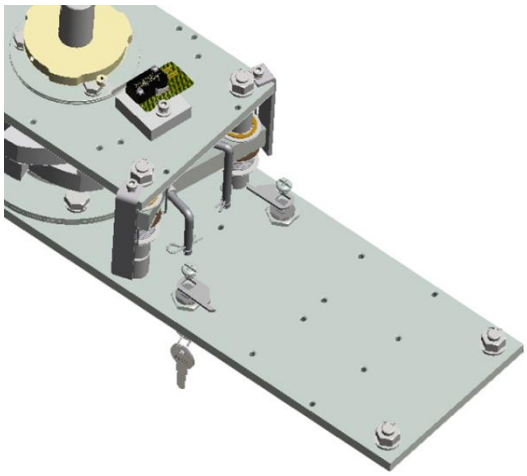


Both solenoids removed

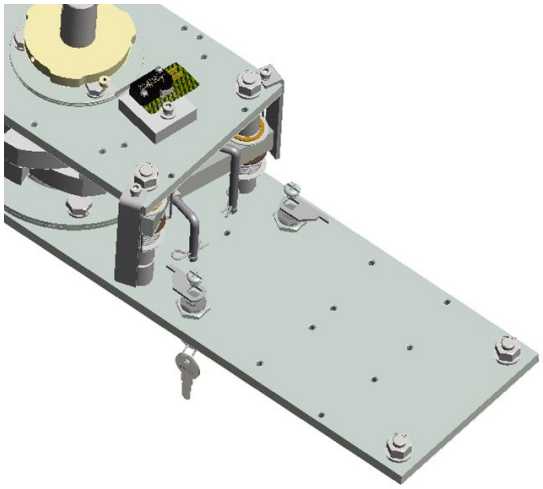
3.5 Change mechanical override.

The pawls of the mechanical override switches will need to be changed.

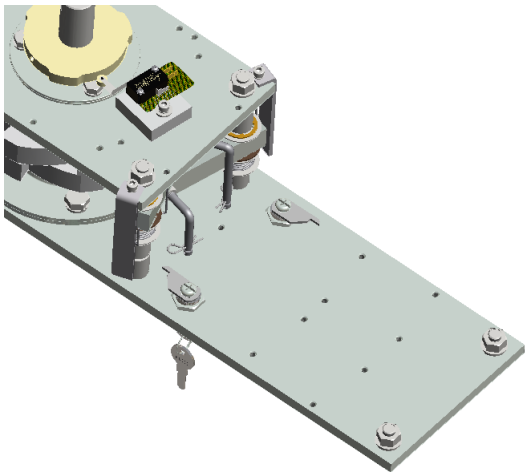
Loosen the screw that holds the pawls in place.



Rotate the pawls 180 degree.

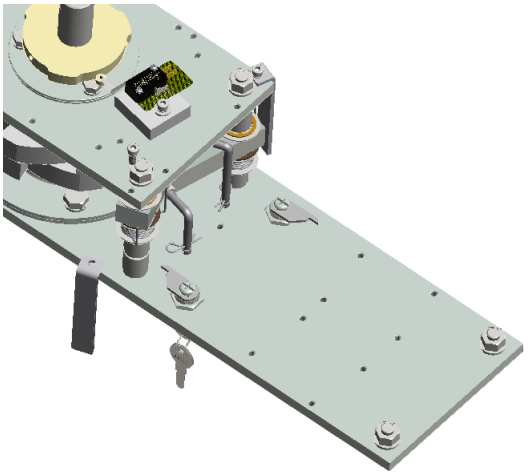


Tighten the screws again.

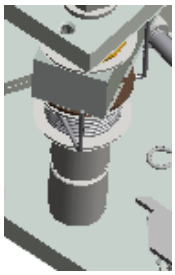


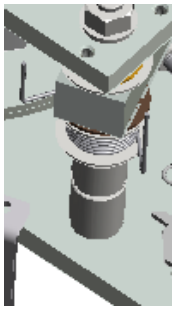
3.5.1 Rotate the locking pawl springs.

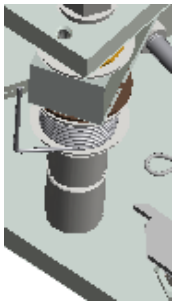
Take the bolt out that holds the bracket out.
Remove the bracket.



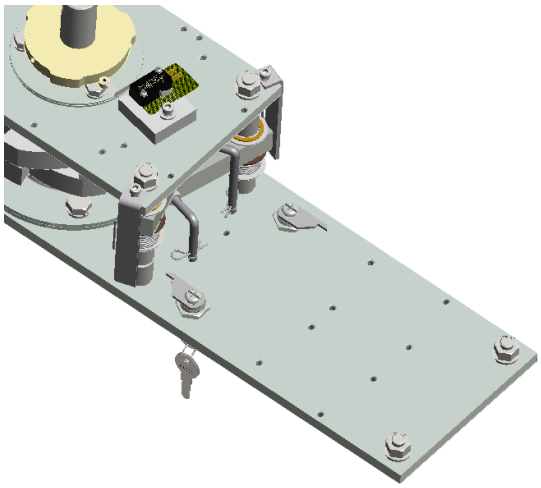
Rotate the spring





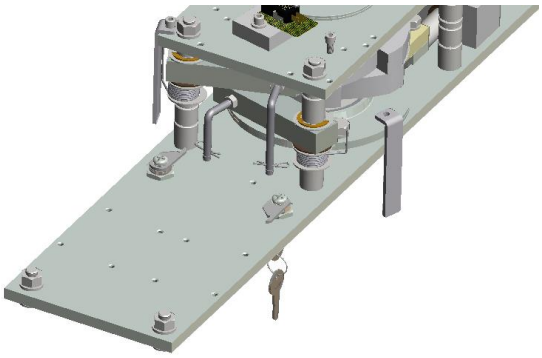


Re-install the bracket and bolt.

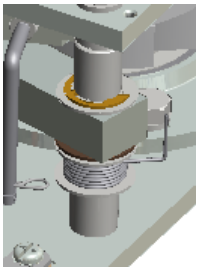


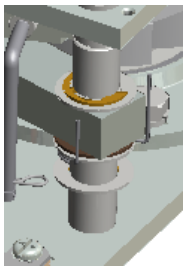
3.5.1 Other side spring

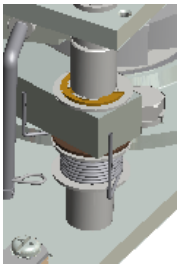
Take the bolt out that holds the bracket out.
Remove the bracket.



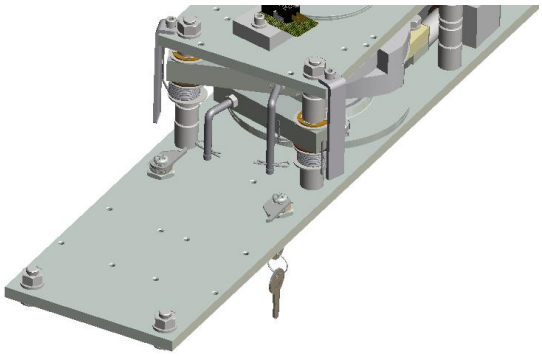
Rotate the spring



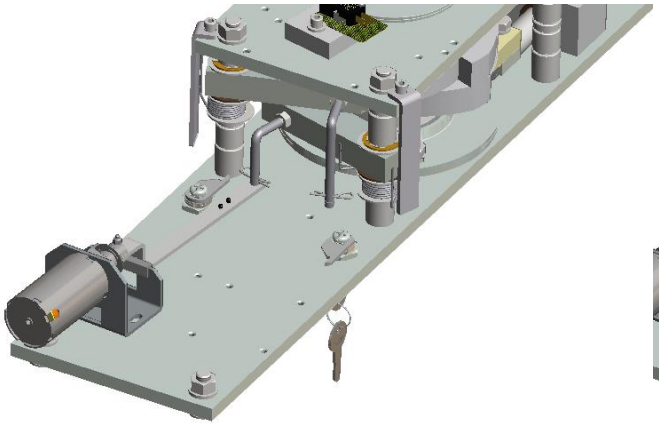




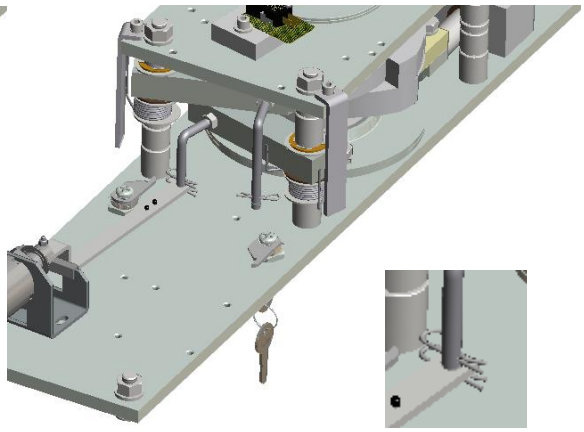
Re-install the bracket and bolt.



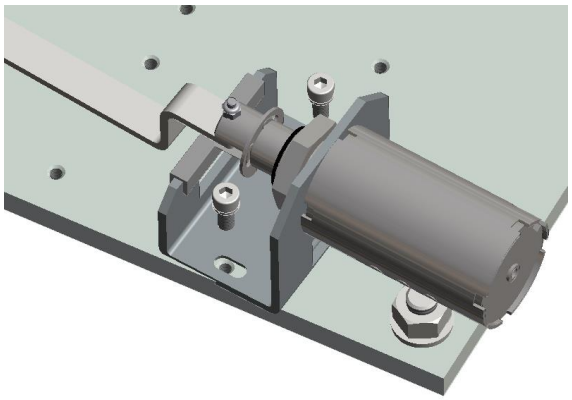
3.5.1 Re-install solenoid

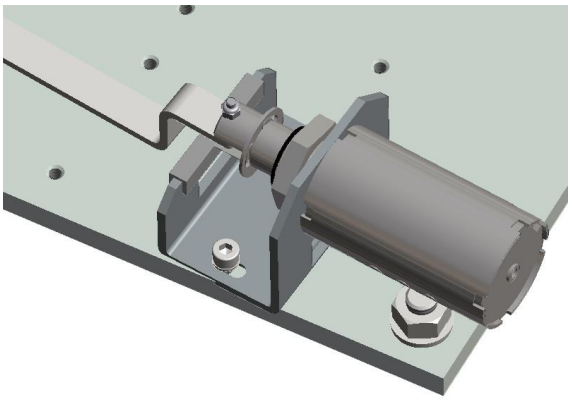


Move the arm on the locking pawl through the hole in the locks bar.



Reinstall the pin.

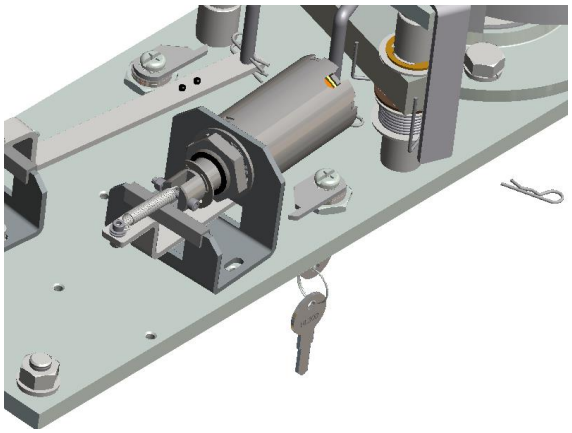




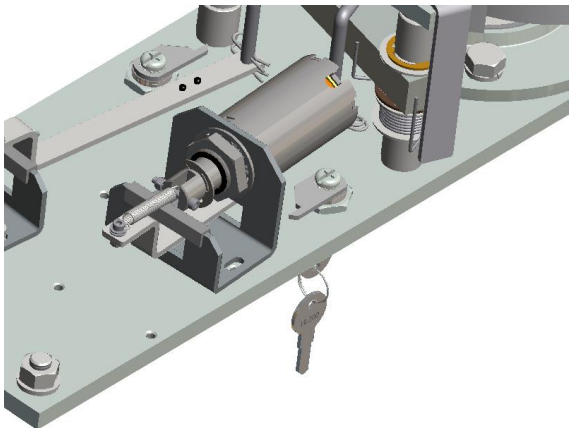
Re-install the bolts.

Note that the used holes are now moved as well.

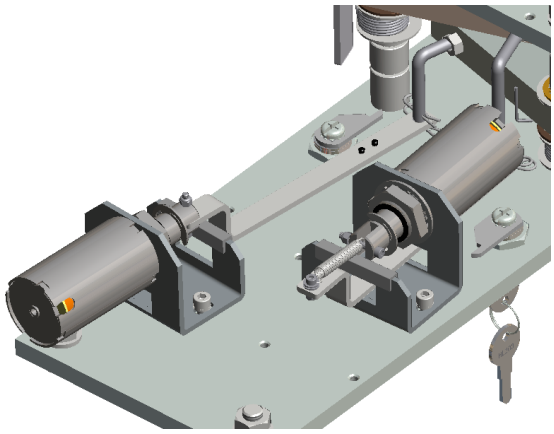
3.5.1 Re-install other solenoid



Move the arm on the locking pawl through the hole in the locks bar.



Reinstall the pin.



Re-install the bolts.

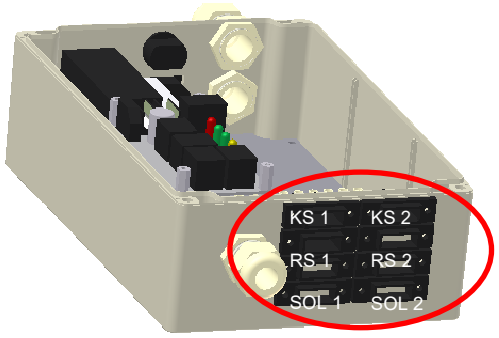
3.6 Electrical changes

3.6.1 Top channel configuration change

When the configuration has been changed the wiring will need to be changed as well.

Unplug the Solenoid 1 (Sol 1) and Solenoid 2 (Sol 2) cable, the Sol 1 cable will need to be plugged into the Sol 2 connector on the control box and the Sol 2 cable into the Sol 1 plug on the control box.

The same will need to be done for the reset switches RS 1 and RS 2.



Factory Connected :

- KS 1 and 2 – Key Switch
- RS 1 and 2 – Reset Switch
- Sol 1 and 2 – Solenoids

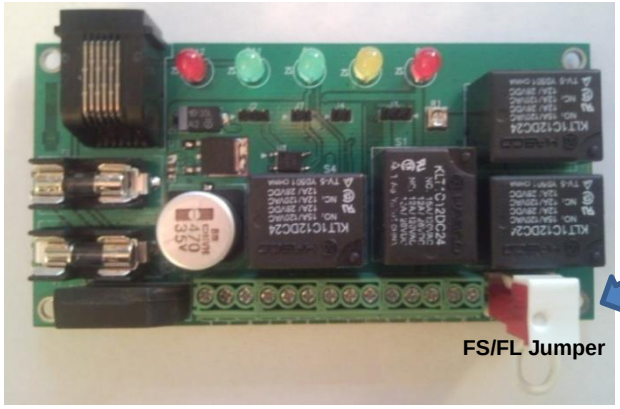
To be connected in Field:

- LED 1 and 2 – Endpost Lights

3.6.2 Lock configuration change

If the locks configuration has been changed the FS/FL jumper as shown below will need to be changed as well to match the lock.

Standard settings of the MCB's top board is Fail – lock.
Standard setting of the MCB's bottom board is Fail – safe.



Fail Safe/Fail Lock Jumper

4 Start-up

WARNING!
Persons should remain clear of the Turnlock top channel mechanism's moving parts.

4.1.1 General

After the Turnlock has been re-configured it will need to be set-up for operation, this can be accomplished by using the start procedure as described below.

- Rotate the unit to its proper resting position.
- Turn power to the main control box on.
  The solenoids should engage and you will hear the lock(s) pull in.
- Green LED on MCB indicates unit is ready for operation.
- At this point, the unit is ready for operation.

SAFETY INSPECTIONS AND MAINTENANCE

6. Safety Inspections

All security entrance equipment requires a simple daily safety inspection to ensure the system is functioning properly. This test must be performed by the owner or facility manager.
Should any safety feature fail to pass the test, the unit must be disabled until repair is complete.
It is recommended that a simple log of such inspections is kept for security and safety purposes.

6.1 Daily Inspection

- Visually inspect area for any trip hazards, sharp edges or other damage.
- Inspect both incoming and outgoing traffic scenarios.
- Inspect the entire unit for unusual noises.
- Present a valid card and manually rotate the unit in the authorized direction(s).
- Verify that traffic lights turn the appropriate colors (if equipped).
- After rotation, the unit should position and lock.

7. Maintenance

7.1 Weekly Cleaning

It is recommended that a minimum weekly cleaning of the equipment be performed to assure proper operation and optimal function.

- Clean exterior finish with a damp cotton cloth.
  Special finishes can be damaged by abrasive cleaning agents.
- Wipe lens covers on cabinets with soft cloth to clean any dirt buildup.
- Clean lexan panels with soft cloth and mild soap.
  Do not use chemical or abraisive cleaners on lexan units.

7.2 Semi-Annual Planned Maintenance

It is recommended that a minimum of two planned maintenance inspections be performed on the equipment by an Authorized BTurnstilesUS agent to assure proper operation and optimal function.

7.2.1 General Inspection

- The technician should report to a contact and always ask if there are any particular issues with the units.
- Make sure to write down any remarks made by the customer on the checklist.
- Perform a visual check for broken materials (sharp edges) or other damages.
- Check the whole unit for unusual noises.
- Check the details of the location on the maintenance checklist (product type, product no.).
- Remove the top channel cover to gain access to the control mechanism and electronics.
- Always check out with contact and/or reception.

7.2.2 Electrical

- Check the safety functions of unit (speed control, heel guards etc., if equipped).
- Perform a function test, ACS controls.
- Check the operation of the solenoids.
- Check earth grounding.
- Check the electrical wiring connections, especially for damage near moving parts.

7.2.3 Mechanical

- Check the anchor mountings and fasten where needed.
- Check the movement of bottom bearing and mounting anchors. Lubricate bearing through grease fitting.
- Check the whole installation for correct alignment with floor (surroundings)
- Inspect locking pawls for wear. Ensure they properly lock and hold.
- Inspect Key override functions
- Inspect Fire Alarm functions (if connected)
- Inspect Power failure functions
- Inspect Dampening system (if equipped) to ensure rotor arms rotate and rest smoothly.

7.3 Maintenance checklist

BOON EDAM

Maintenance Checklist: Turnlock ( )

Project no.: . . . . . **Project Name:** . . . . . .
Serial no. : . . . . . **Location :** . . . . . .

Date: / Work Order no. : / Name technician :	CHECK	CLEAN	ADJUST	GREASE	OK	NOTES
1. General						
A Visual	X	X			O	
B Noise	X				O	
2. Mechanism						
A Speed Control unit (operation+ noise)	X		X		O	
B Top Plate Bolts	X		X		O	
C Centering Disc Blocks	X		X		O	
3. Electrical						
A Inspect Fuses	X				O	
B Main Control Board Functions	X				O	
C Cable Connections	X				O	
D Micro switches	X		X		O	
4 Rotor Arms						
A Mounting Bolts	X		X		O	
B End Caps	X				O	
C Arm Condition	X	X			O	
D Bearing	X	X		X	O	

	CHECK	CLEAN	ADJUST	GREASE	OK	NOTES
5 Functions						
A LED Functions	X	X			O	Option
b Access control system pulse	X		X		O	Duration
c General operation	X		X		O	
d Power Fail action	X		X		O	
e Fire Alarm Function	X				O	
f Wiring (connections)	X				O	
g						
h						
i						
j						
k						
l						

√ = Checked and OK X = Work to be carried out

Recommendations + Remarks

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

Signed as correct by client:

On behalf of client (please print):

. . . . . .

Function: . . . . . (Signature and Date)

Maintenance checklist

TROUBLESHOOTING

8. Troubleshooting

	**WARNING!** Switch off the power supply to the product before working on the product.
	**WARNING!** Risk of personal injury or loss of life.
	**CAUTION!** All installation and maintenance work on the product must be carried out by TurnstilesUS personnel or by an approved agent.
	**CAUTION!** The material may be damaged or the operation of the system affected.

8.1 Control Box and Main Control Board

- Check the two 1.5A fuse and mains power supply 2.5A fuse(s) when the system does not appear to be powered up. The LED's on the MCB will be blank if power is not present. The fuses are located in the power connection box on the MCB.
- Powering down the entire Turnlock by shutting down the power and waiting for approx. 30 seconds before powering it back up.
- Let the unit fully initialize.
- Check connection of electrical cables to control box. Verify proper label and plug connections.

8.2 Top Channel Mechanism

- Speed control dampening.
  If the speed control system is not dampening properly, adjust the shock absorber system until the desired results are achieved.
- If unit is not locking properly, inspect proper function of the locking solenoids, power supply and connection plugs of the control box.
- Inspect spring tension of locking pawl system and springs to ensure proper tension.
- If the unit does not unlock properly, inspect card reader functions and connection of access control wiring inside the main control box.

8.3 Rotor Assembly and Frame

- Loose rotor arms.
  Check M10 bolt connections of rotor arm assemblies.
- Incorrect Home Position.
  Check alignment of Top Channel shaft pin and top flange guide.

TECHNICAL SPECIFICATIONS

9. Technical specifications

9.1 Control

Main Control Board:	24VAC, 1.25 Amp max draw.
Main Transformer:	110/220VAC primary. 20VAC secondary output. CSA and UL approved.

9.2 Solenoids

Power supply:	24 VDC
Duty Cycle:	100% ed
Temperature range:	- 20°C / + 55°C (-4 F / 131 F)
Response time:	±20ms

9.3 Complete barrier

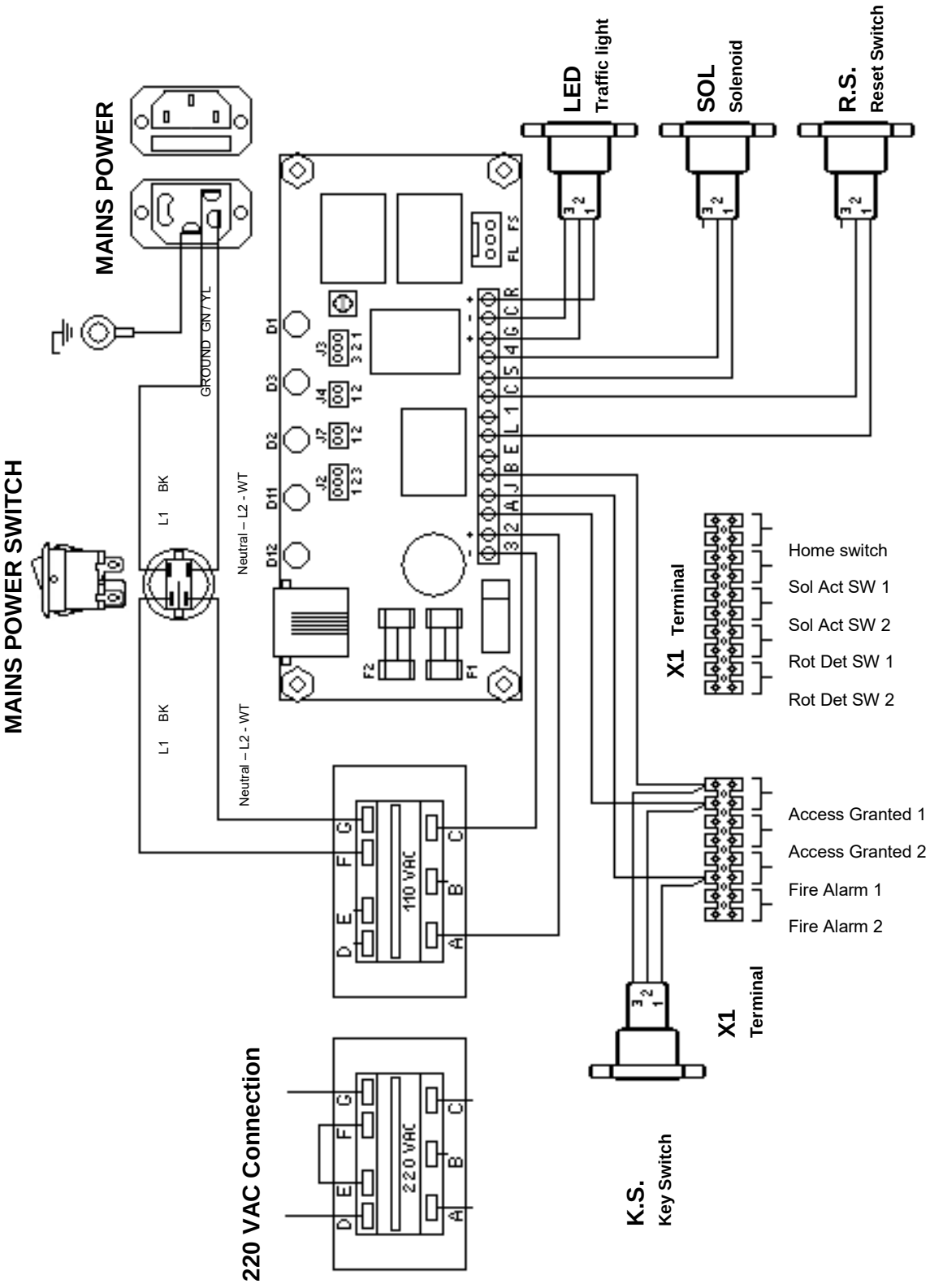
Type:	Three-wing (optional 4th wing) steel, stainless steel or aluminium access control mechanical turnstile.
Application:	Manual turnstile that allows controlled access to authorized persons
Capacity:	Controlled access (1 direction), nominal capacity: 15 to 30 persons / minute.
Finish:	Stainless steel - AISI 304 with a #4 grain finish, anodized aluminium finish.
Rotor Arms:	Anodized aluminium finish, Lexan arms.
Overall height:	89” (2261mm) overall height. 81” (2057mm) walk through height.
Weight:	Approx. 800lbs (360kg), including crate.
Installation:	Typical Concrete type anchors.
Cabling:	Power supply, fire alarm & communication cables (see drawings)
Power supply:	Configurable 110-240 VAC, 50/60 Hz
Mains Fuse:	2.5 Amp.
Main Control Board Fuse:	1.5 Amp.

10. Spare parts

10.1 Spare Part list

Part Number	Description	Comment	1>5 Units	6>Units
10920	Solenoid Assembly Cable	Standard Solenoid with lead wires and plug.		
50040224	Mains Connector w/Fuse	Control Box		
101-009	Transformer, 110/220VAC	Control Box		
10905	Mains Power Switch	Control Box		
10904	Main Control Board	Control Box		
10947	2.5A Fuse	Fuse in mains switch		
10927	1.5A Fuse	Fuse in MCB		
17001	Bottom Bearing B334(INA)	Lower center bearing assembly		
100-042	Top Bearing (GYA108RRB)	Upper center bearing assembly		
100-128	Locking Pawl Spring LH	Typical for Fail Safe		
100-129	Locking Pawl Spring RH	Typical for FS/FL Combo		
100-131	Connecting Spring	Typical for FS locking		
101-012	2 Way Micro-switch	Home Position/Rotation Det.		
101-015	Micro-switch Gasket	Isolation material for micro-switch		

11. Electrical Schematics



Electrical Schematic

12. Enclosures

In this chapter specific information regarding the project can be added.