2000/2500 DEVICE/OPERATOR & 4000 RETRO

MAINTENANCE & REPAIR PARTS MANUAL

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2000/2500 LOCKING DEVICE or OPERATOR & 4000 RETRO

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SPECIFICATIONS

2000/2500 - RACK & PINION DRIVE
CELL DOOR & CORRIDOR DEVICE SPECIFICATION

DESCRIPTION

The 2000/2500 is a motor driven rack and pinion drive sliding door operator built for maximum security. It can be electrically operated open or closed or mechanically unlocked during a power failure. The device operates identical to a chain drive in that without power, the motor can be back-driven open for emergency purposes.

APPLICATION

The 9000 is designed for cell door applications. The 2500 is designed for corridor door model applications. The major difference between the two models is the 2500 commonly utilizes a release column at the close end of door, while the 2000 may be unlocked via a linked master bar system from a mechanical control cabinet.

FUNCTION OF THE 2000 & 2500

The 2000/2500 & 4000 is deadlocked in a closed position with two point locking at the rear of the door. Remote electronic controls dictate door operation. It can be electrically unlocked and will travel to a partially opened or fully opened and locked position. The direction of the door movement can be immediately reversed via action upon electric control switch. During travel, force applied to the door will stop the door movement. Once the force is removed, the door will continue to travel in the intended direction. When stopped in mid-travel and no power, the door may be pushed to a fully opened or fully closed position.

Emergency function of the 2000/2500 and 4000 is that the door may be mechanically unlocked by either mogul or paracentric key. The door may be pulled open during a power failure and the motor back-driven, which prevents the door from being free-wheeling.

FEATURES

- Rack and Pinion-14 ½° Spur Gear w/ #10 Pitch and 1” x 5/8” Rack
- 1/11 HP Variable Speed Motor – 24 VDC with 24 VDC Power Source, 90VDC with 120 VAC Power Source, or 180 VDC with 220 VAC Power Source
- Motor Drive and Connection PC Board are Easily Access and Removable
- Non-Handed Mechanism Assembly Eliminates Right and Left Handed Repair Parts
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- Easily Removable Mechanism Plate Assembly is Designed for New Construction and Retro-fit Applications
- Variable Speed Control provides Flexibility in Door Operation Time
- Door is Deadlocked above Two Concealed Locations and the Mechanism cannot be Manipulated to an Unlocked Condition by Forcing, Lifting or Prying the Lock Bar in either the Locked Closed or Locked Open Position

- Full 1” Lift of Vertical Lock Rod Provides Highest Degree of Lock Engagement at Door
- Unique Pivoting Lift of Lockhead from Carriage Reduces Bushing Wear on Slide Assembly
- Concealed Switches located forward in the housing for easy access, serve as Motor Limits, Deadlock Monitoring, and Door Indication Status Back at the Control Panel
- Door Operating Force is Electronically Controlled through a Current Limiting Motor Board and Eliminates Mechanical Clutches
- Mid-Travel Indication Status may be provided by Removing a Jumper on the Termination PC Board
- During the Electrical Operation, the Travelbar Carriage uses a Pivoting Lift to Smoothly Unlock the Lockhead
- Provisions on PC Board for Multi-Plex Control
- Equipped to Handle a Variety of Control Voltages Including: 120VAC, 220VAC, 12VDC, 24VDC, 12VAC, 24VAC, etc.
- 9/16” Diameter Cold Drawn CRS 1045 High Carbon Steel Track, Welded to Housing
- 7 Gauge Steel Housing with 10 Gauge Top and Hinged Cover
- Door Carriage- 3/8” Front and Back Steel Bar Construction
- (2) 2¾” Outside Diameter Steel Rollers with Double Shielded Steel Ball Bearings, Attached with ½” Steel Bolts and Lock Nuts
- 1/4” Steel Plate Door Hanger, Door Guide Angle, and Bottom Guide
- Eccentric Bushings at Door Hanger to allow Vertical and Horizontal Door Adjustment
- 7/8” Diameter Hardened Steel Bi-Directional Lock Head Roller
- 3/16” Thick Pivoting Deadlock Lever
- 1 ½” Square Tube Heavy Walled Vertical Lock Column
- 10 Gauge Formed Steel Door Receiver
- Hard Rubber Door Stop to Cushion Door Opening.

OPTIONS

- Electric Key Release at Emergency Release Column
- Mogul Mechanical Key Release at Emergency Release Column
- Emergency Release Column (for Corridor Units) 7 gauge Manual Lock Pilaster with 10 Gauge Removable Cover attached w/ Security Torx Screws
- Paracentric Key Release (for Corridor Units) at Emergency Release Column

COMPONENT DESCRIPTION 2000/2500
4000 COMPONENTS VARY WITH RETROFIT

HOUSING – The housing is a metal enclosure made from 7 gauge hot rolled sheet for the base and 10 gauge hot rolled for the cover. Its purpose is to secure the electro/mechanical components from outside abuse and to insure continual operation. The housing should always be perpendicular to the vertical lock column and level to provide proper operation.

MECHANISM ASSEMBLY – The mechanism assembly (10" x 10 1/2") is the electro /mechanical component that mechanically deadlocks the lock rod in the vertical lock column and prevents tampering of the lock rod. It also provides the support for the motor and switches for electrical operation, as well as the mechanical release bars that provide individual or all door release to open the door in the event of electrical failure or in an emergency situation. The mechanism assembly also provides an attachment place for the electronic motor drive and the logic and connector board for electrical operation and speed variation.

LOGIC & CONNECTOR BOARD – The logic and connector board houses the DC motor drive and the connector board for the operation of the DC motor and the connectivity of the wires from the limit switches, monitoring switches, and all the electronic components that operate the device. The connector board is arranged so that none of the plugs can be accidentally wired. It also houses the relays that run the opening and closing of the device.

TRAVELBAR ASSEMBLY – The Travelbar assembly is essentially a two roller or four roller trolley that securely holds the door in position. It also acts in direct relationship with the motor to provide the unlocking of the vertical locking mechanism. There is a 1½" pre-travel (slide motion) that flips the locking mechanism upward when the spur gear on the rack moves to open or close. and releases the lock at the bottom rear of the door, as well as the lockhead behind the travel bar.

VERTICAL LOCK COLUMN – The vertical lock column houses the locking rod that engages with the notch in the door guide that locks at the bottom of the door. This rod is also connected to the mechanism plate in the housing that lifts the rod and the lockhead out of a locked condition when the motor opens or closes the door, or when the unit is mechanically opened by key.

RECEIVER – The receiver is a metal stop that is engaged by the door in the locked closed position. The receiver slightly wraps around the door edge minimizing any attempt to pry the door open.

RELEASE COLUMN – Release column is an enclosure at the front end of the door that houses the mechanical mechanism or lock, which opens the door in case of an emergency. It has a secured cover, which allows access to the release cable from the mechanism plate.

DOOR HANGER & DOOR HANGER BAR – The door hanger and the door hanger bar are the pieces that attach to the top of the door to attach the door to the Travelbar assembly. The hanger provides adjustment for the door to properly align it with the door receiver. The door receiver, vertical lock column and door should always be parallel to provide proper alignment and locking.

DOOR GUIDE AND DOOR GUIDE ANGLE – The door guide and door guide angle provides a secure guide for the door during opening and closing. The door guide angle provides the notching at both ends, which allows locking of the vertical lock rod inside the bottom lock at the bottom of the vertical lock column.

METHOD OF OPERATION

MECHANICAL METHOD OF OPERATION

The “Logic & Connector Board” is the junction point for the motor drive, deadlock switch, motor limit switches, and field wires.

The logic and connector board control, operates on variable voltages depending on the motor specified. A 24 VDC motor operates on 24 VDC power voltage and 24 VDC control voltage. The 90 VDC operates on 120 VAC power. The 180 VDC operates on 220 VAC (1 Phase). Both the 90 VDC and the 180 VDC may be controlled by requesting a desired voltage for the plug-in relays on the Connector Board. This voltage may range between 12 VDC to 220 VAC.

In the locked closed position, an open switch signal from a control switch operates the motor and initiates the pre-travel motion of the travelbar assembly to raise the lockhead and unlocks the deadlocked vertical lock rod from the bottom lock at the bottom rear of the door.

An “off” position on the control switch will stop the movement of the door at any position in its travel.

In the locked open position, a close switch signal from a control switch operates the motor and initiates the pre-travel motion of the travelbar assembly to raise the lockhead from a locked position and unlocks the deadlocked vertical lock rod from the bottom lock at the bottom front of the door.

There is two-point locking at the vertical lock rod and lockhead, and the vertical lock rod is deadlocked in both fully closed and open positions. The deadlock switch in conjunction with the door position switch (a function of the 5 wire motor limit switch) provides a secure indicator when the door is in the locked closed position.

Depending on control functionality, the 9200 (cell device) is capable of operating independently of each of the other doors, as well as operating in a group function mode.

Optional wire harnessing may be provided for cell conditions, which provides proper wire hook-up to the full run of cell units. Terminations are made through connector plugs at each housing location and common jumpers throughout the full run of doors.

ELECTRICAL METHOD OF OPERATION

A DC electronic motor drive and logic connector board are mounted to a removable plate and attached by two pins to the mechanism plate assembly.

The motor drive allows a variation in motor torque and speed control from a source power of 24 VDC for the 24 VDC motor, 120 VAC for the 90 VDC motor and 220 VAC for the 180 VDC. The motor drive converts and supplies the necessary power voltage to the gearmotor.

The logic and connector board (L & C Board) functions as a “Termination Center” for all circuitry controlling the 2000/2500 unit, which provides the opening and closing functions of the unit as well as monitoring proper door status. An in-travel indicator is also available from the board, which provides the status between open and closed by the removal of a jumper.

Multi-plex control is an option with the L&C board by providing a location to install the necessary printed circuit components.

Three relay sockets are mounted to the L & C board. Two of the sockets are dedicated to relays for the open and close motor control operation of the device. The third relay provides a means for operating existing six wire control systems.

There are three limit switches on the mechanism assembly. Two of these switches are motor limits, controlling power cut-off to the motor at the end of the open or close operating cycle. Of these two, the five wire switch also dictates door position and ultimately hands the device. It is always attached to the switch bracket on the side to which the door closes. The second of these two switches (a two wire switch) functions strictly as a motor limit switch and is attached opposite the side of the five wire switch.

The third switch is a deadlock switch, which in conjunction with the five wire motor limit switch, provides status for the closed, deadlocked position of the device.

Receptacles on the L & C board are marked and specially mated for the following connections.

- Six pin receptacle for the DC drive board
- Three pin receptacle for the 90VDC gearmotor
- Twelve pin receptacle for field wiring from control
- Twelve pin receptacle for the limit and status switches

The **variable motor speed knob** is attached on the left end of the L & C board and DC drive plate.

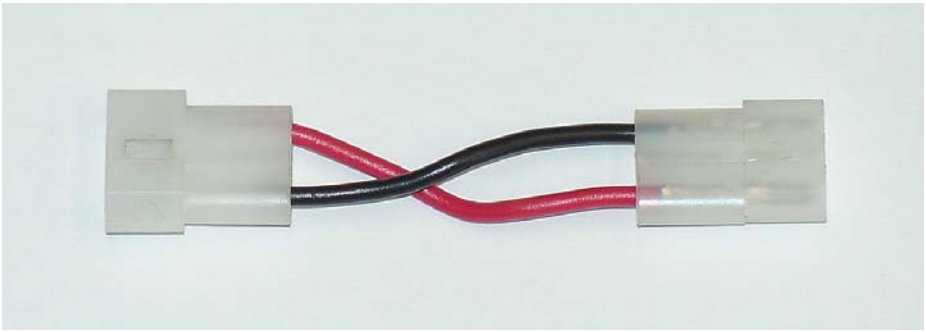
HANDING NOTES:

As previously mentioned, the handing of the device is regulated by the position of the five wire switch being attached to the switch bracket on the side of the device, to which the unit closes.

A DOOR CLOSING TO THE RIGHT IS ALWAYS A RIGHT HAND DEVICE
A DOOR CLOSING TO THE LEFT IS ALWAYS A LEFT HAND DEVICE

On a right hand device, the five wire switch is always right of the vertical lock column center.
On a left hand device, the five wire switch is always left of vertical lock column.

ALL LEFT HAND DEVICES REQUIRE THE MOTOR ADAPTOR BETWEEN THE MOTOR PLUG AND THE L & C BOARD RECEPTACLE



Left Hand Motor Adaptor

STANDARD ADJUSTMENTS

DOOR SPEED ADJUSTMENT

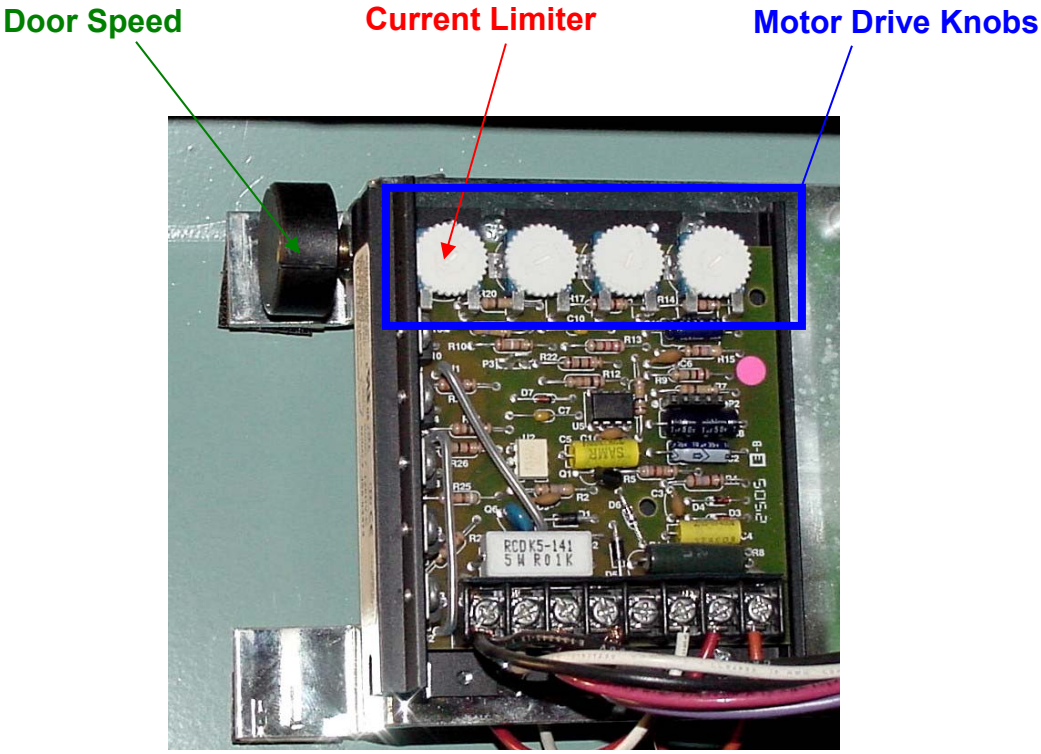
Motor Drive Knobs should be set to positions on Motor Drive Setting Sheet (See Next Page)

(CL) **Current Limiter** and the Door Speed Adjustment Knob are the only two variable adjustments required.

Turn **Current Limiter** Knob Counterclockwise or Clockwise to either – Slightly Lower or Raise Door Edge Pressure

Turn **Door Speed** Knob Counterclockwise or Clockwise to either – Slightly Decrease or Increase Door Speed

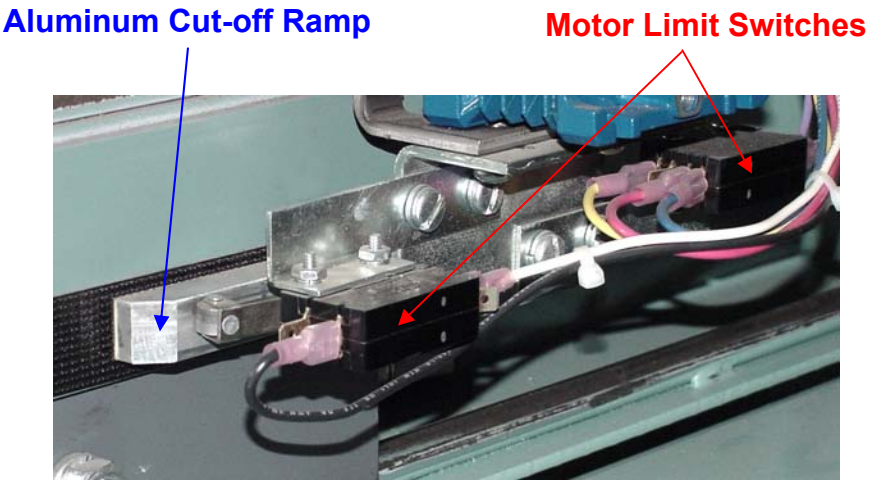
(Door Speed should never be set where door slams into receiver)



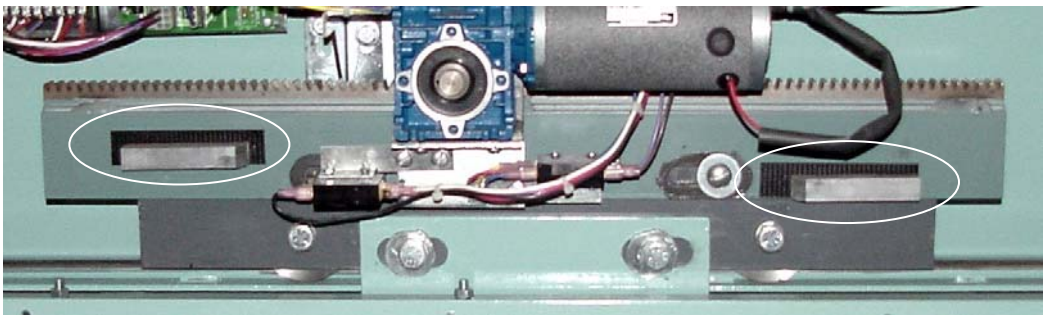
MOTOR LIMIT SWITCH ADJUSTMENTS

Motor Limit Switch adjustment is accomplished by slightly bending the switch roller arm to make trip contact with the **aluminum cut-off ramp**.

The ramp should be adjusted to allow the door to coast into the fully open or fully closed position. This is accomplished by adjusting the position of the aluminum cut-off ramp on the interlock strip. A screw drive tip under one end of the ramp will loosen the ramp for readjustment. Once readjusted, make sure the ramp is securely set onto the interlock strip.



Aluminum cut-off ramps may need to be moved depending on Door Speed
(Slight variations may not require adjustment)

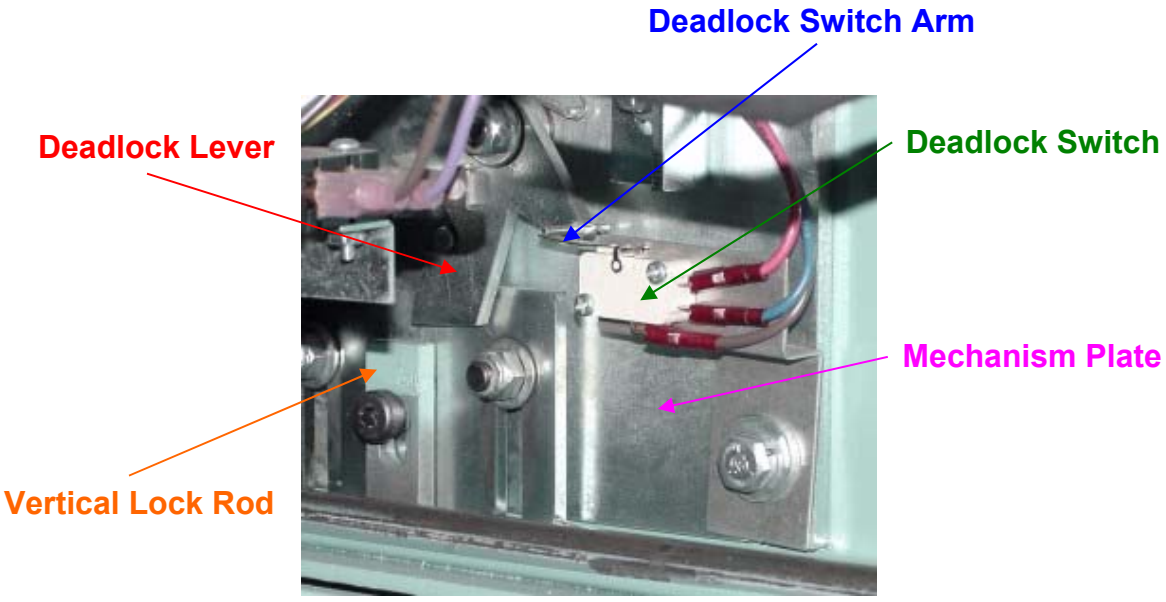


Faster Door Speed, Move Ramps Inward

Slower Door Speed Move Ramps Outward

DEADLOCK SWITCH ADJUSTMENT

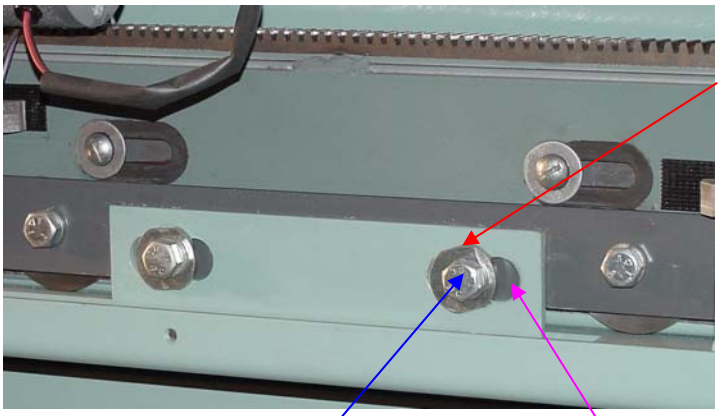
The **deadlock switch,** located on the **mechanism plate** must be adjusted to trip when the door is in a fully closed position or fully open position. The **deadlock switch arm** can be slightly bent by means of long nose pliers. The deadlock lever must be fully engaged over the vertical lock rod.



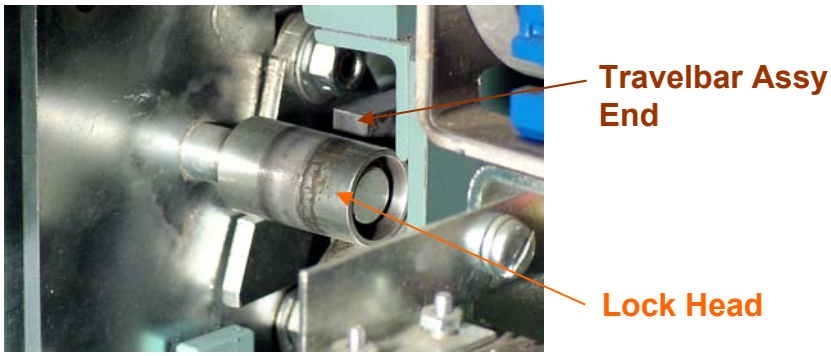
Adjustment must be made so the switch trips while the **deadlock lever** is engaged over the **vertical lock rod** and it must trip to red before deadlock lever disengages over the vertical lock rod

DOOR ADJUSTMENT

By being offset from center, the two **eccentrics** may be turned independently to plumb the door up, down and side-to-side. This provides the means to set the door parallel to the vertical lock column and allow proper locking of the vertical lock rod in the door guide angle at the bottom of the door. When the **eccentrics** and **door hanger bolts** are loose, the door can be tapped back and forth horizontally for adjustment on the **door hanger slots**.



For Correct adjustment between the door and lock head, the door must be held solid against the door receiver and there should be approximately 1/8" gap between the **lock head** and the travel bar assembly. This eliminates binding between the lock head and the **travel bar assembly** as the lock head lifts in the unlocking operation as the door opens or closes. Once in position, the eccentrics can then be held and the **door hanger bolts** can be tightened.



Appr. 1/8" Between Lock Head & Travelbar Assy with Door Against Receiver

LUBRICATION & MAINTENANCE

LUBRICATION AND MAINTENANCE GUIDE

LUBRICATE THE FOLLOWING WITH SUPER-LUBE:

1) LOCKHEAD SLOTTED GUIDES
2) RACK
3) TRACK
4) SLIDE BAR SLOTS
5) BOTTOM LOCK
6) ALL PIVOT POINTS

NOTE:

DOOR ROLLER BEARINGS ARE PERMENTLY SEALED.

1) LOCKHEAD ROLLERS HAVE OILLITE INSERTS.
2) LIGHTLY LUBRICATE WITH HIGH GRADE OIL.

NOTE:
APPLY LUBRICANT SPARINGLY.

MAINTENANCE

Maintenance Involves:

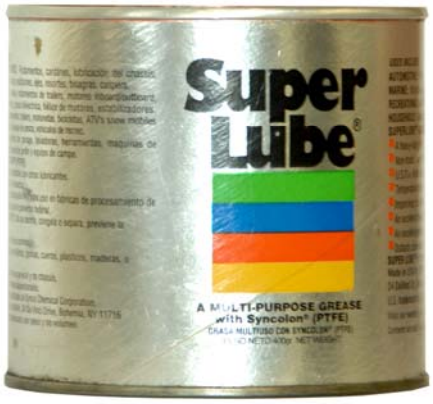
- Lubrication of All Necessary Listed Components
- Checking Adjustments on Switches and Door Alignment
- Checking for and Replacement of Worn or Broken Parts

Maintenance Should be Performed:

- Once a Year on Cell Doors
- Twice a Year on Corridor Doors or every 50,000 Cycles
- Every Three Months or 50,000 Cycles on High Usage Doors

Records Should be Kept on all Maintenance Procedures on a Per Door Basis to Insure Compliance with Warranty Requirements.

RECOMMENDED LUBRICANT



Super Lube® is a patented, multi-purpose synthetic lubricant, containing SYNCOLON® (PTFE) particles held in suspension. Super Lube® lasts longer and outperforms conventional petroleum-based greases. Super Lube® Grease is an exceptionally pure lubricant, because it is synthetic. This gives Super Lube® very stable and predictable chemical properties.

Super Lube® Grease with SYNCOLON® (PTFE) contains Polytetrafluoroethylene(PTFE) which is the most slippery surface (lowest coefficient of friction) known to man. The SYNCOLON® (PTFE) particles in Super Lube® fill surface irregularities of mating parts and are compacted to form a smooth, lubricated surface.

SYNCOLON® (PTFE) provides improved anti-wear properties, is waterproof, not washed away by acids or alkalis, and resists temperatures to 750°F. The SYNCOLON® (PTFE) particles in Super Lube's unique patented formula are held in constant suspension ensuring they will always be evenly applied to the lubricated surface.

Super Lube® Grease is also available in a Silicone formulation.

MAINTENANCE RECORD

RECOMMENDED TO COMPLETE FORM WHEN SERVICE IS PERFORMED

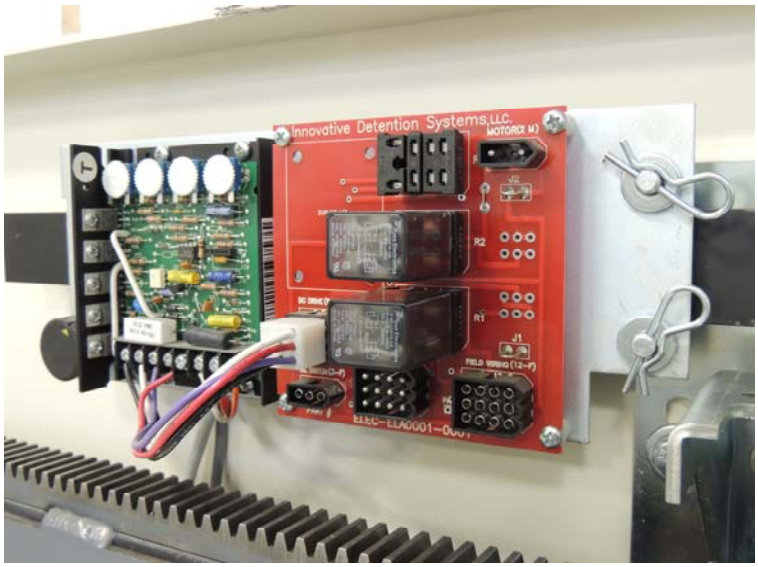
DATE	LOCKING DEVICE TYPE	DESCRIPTION OF WORK PERFORMED	REMARKS

REPAIR PARTS

ELECTRICAL COMPONENTS

MOTOR DRIVE
2000-ELC0001-0125

CONNECTOR BOARD
2000-ELA0001-0001



GEAR MOTOR – MOTO-ELC0120-0001

MOTOR LIMIT SW
SWIT-ELC0002-0001

DEADLOCK SW
SWIT-ELC0001-0001

PRODUCT WARRANTY

CM DETENTION PRODUCTS, LLC., (CMD) states that all our products are manufactured to the highest standards of quality and workmanship and that the operation and function of these products are warranted from defect in their original manufacture for a period of Thirty-Six months from date of delivery. Products and/ or components supplied by and/or used by in the manufacture of CMD product, but not manufactured by CMD, carry the warranty provided by that specific product or component manufacturer.
IDS does not warranty against products subjected to abusive usage or products shown to be altered, modified or adjusted without prior knowledge consent and authorization from CMD.

At our option, CMD will repair or replace only proven defective product, provided the customer has properly stored, installed adjusted, maintained and operated the product in accordance with CMD requirements and recommendations.

CMD reserves the right to verify any and all claims of defect through direct inspection of product returned with shipment prepaid to the factory. Final judgment as to warranty claim is the exclusive right of CM Detention Products, llc. and supersedes any and all other warranties.

FIELD REPAIR WARRANTY POLICY

Any warranty issue involving CMD product, whether by purchaser, installer, end user or any other party, requires full acknowledgement, technical assistance and ***written authorization from CMD prior to any work performed***.

Work performed without prior written authorization will not be covered by warranty, will not be subject to back charge claim or reimbursement and will void any outstanding warranty to that specific product.

This policy provides the customer or end user a product fully warranted by CMD and allows CMD the opportunity to insure that any required modification to the product, or any part thereof, is appropriate to the integrity of that product and that the specific work is justified.