

# **OPERATIONS AND MAINTENANCE MANUAL**

## **DOUBLE KNIFE EDGE**

### **RCM DOOR**

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## **1.0 INTRODUCTION**

Considerable emphasis in this text is placed on preventative maintenance. Preventing the problem BEFORE it occurs. Our goal for our customers is a comparatively minor investment of time spent on proper, minor periodic preventative maintenance to eliminate costly repairs in the future and the inconvenience of down time. The door units have been manufactured to precise standards and tolerances and have been designed for high performance and durability.

## **2.0 PERIODIC MAINTENANCE SCHEDULE**

### **2.1 WEEKLY**

Clean the inner and outer double knife blades on the door leaf with a Scotch-Brite (TM) pad to remove any residue and re-clean the blades with a soft clean cloth soaked with acetone or a similar solvent.

### **2.2 MONTHLY**

Using a soft rag and a 3" putty knife (the rag should completely cover the blade portion of the putty knife), insert the putty knife and rag into the double knife edge receiver, starting at the top center of the door. For the upper and lower horizontal receiver channels, slip the putty knife and rag into the receiver channel and work (in an in and out manner, DO NOT SLIDE ACROSS FINGERSTOCK!) it towards a corner, repeat in the opposite direction. For the vertical receiver, start at the top of the channel by slipping the putty knife and rag into the channel and work down to the bottom. Repeat for the opposite channel. Do not use an excessive amount of solvent. Use proper ventilation, eye protection, and protective clothing. Allow the solvent to evaporate, and repeat the entire procedure. If a source of clean, dry, oil free air is available, it may be applied to speed drying time.

### **2.3 EVERY SIX MONTHS**

- 1) Fold a piece of emery cloth (#320 grit) over a section of 1/8" thick tempered masonite or a plastic sheet cut to 3" x 6" with the sanding surfaces facing out. Slide the sanding assembly straight into and between the rows of contact fingers located in the double knife edge receiver. With two or three strokes, burnish the surfaces of the contact fingers. Move to the next section, and with a 1/2" overlap, repeat this procedure around the entire perimeter of the double knife edge receiver. Be sure to burnish both rows of fingerstock. DO NOT move the sanding assembly side to side or up and down as the edges of the sanding paper will snag and damage the contact fingers. Thoroughly clean the residue from this procedure with the solvent procedure described above.
- 2) Lubricate hinges on models manufactured prior to January 1989 with a few drops of light machine oil. Wipe off any excess.

- 3) Do not lubricate hinges on door models manufactured after January 1989. These hinges have self lubricating RULON bearings and require no additional lubricants.
- 4) Remove the latching mechanism protective cover from the door leaf and lubricate the nine bearings on the latch bar assembly, with one drop of light machine oil. Remove any excess.
- 5) Apply an ample amount of light weight grease to the two latch bar guide blocks.

**DO NOT LUBRICATE THE DOOR HANDLE SHAFT ASSEMBLY ON ANY MODELS!**

- 6) Check periodically for any loose bolts and any wear or play on the door handle/spindle assembly. Procedures for disassembly, assembly and adjustments are listed below.

#### **2.4 YEARLY**

- 1) (Optional) Replace the fingerstock around the entire perimeter of the Recessed Contact Mechanism. NOTE: The necessity of finger replacement will vary based on different environmental conditions and door use. For optimum RF performance we recommend replacement every one to two years. Follow the replacement procedure listed below.
- 2) Disassemble and clean the door handle/spindle assembly following the procedure listed below.
- 3) Disassemble and lubricate the latch bar assembly following the procedure listed below.

#### **3.0 FINGERSTOCK REPLACEMENT PROCEDURE**

- 1) With a hex drive, remove the caphead screws (approximately 80 each) from the removable brass center bars located in the center of the RCM. Mark the center bars left, right, top, and bottom for replacement.
- 2) Strip away the contact fingers from each brass center bar. Strip the fingerstock from both sides of the RCM receiver channel. The width of the bronze channel allows ample space to achieve this task. Discard the used fingerstock. Do not attempt to re-use.
- 3) Remove any adhesive residue with solvent. Clean the exposed surfaces of the brass center bar and the RCM channel with a Scotch-brite pad. Using a #320 grit sandpaper or emery cloth, etch the surfaces of the brass and bronze components that the new replacement fingerstock will adhere. Reclean these surfaces with solvent.
- 4) Replace the Beryllium copper fingerstock with Lindgren part No. The recommended procedure for handling this material is to use a pair of cotton or surgical rubber gloves. Fingerprints will prematurely etch this material, and reduce its effective performance. Beginning in one corner, strip away the protective paper backing from the two foot length of fingerstock and attach the adhesive backed strip to the side of the bronze RCM channel. Be sure that the end of the fingerstock material compresses into the RCM. Special attention should be given to attaching each strip in a straight line.

Align the edge of each strip with the leading top edge of the RCM channel. After positioning the two rows of replacement material around the perimeter of the RCM channel, using a wide blade putty knife, apply pressure to each section of material to be sure that the adhesive is uniformly attached to the bronze surface. Attach fingerstock to each side of the removable brass bar and re-install. With the RCM reassembled, and in proper alignment, apply hot air with the use of a heat gun. **DO NOT OVERHEAT.** Apply sufficient heat to bring the adhesive backing to a semi-soft state to allow the adhesive to grip and set into the previously etched surface. Allow ample time for the heated metal to return to room temperature, **BEFORE** engaging the door leaf.

#### **4.0 DOOR HANDLE/SPINDLE ASSEMBLY MAINTENANCE**

- 1) To adjust or clean the door handle/spindle assembly, first remove the caphead screw and lock washer from the front door handle center.
- 2) Remove eight screws securing the latch bar protective cover to the doorleaf, and place the cover aside.
- 3) Loosen the hex drive set screw in the rear door handle (89 models, remove the cap head bolt and lock washer, and the rear door handle.)
- 4) From the rear side of the door leaf, remove the thrust bearing and *two* hardened and ground washers and the RF mesh gasket from the one-inch steel door shaft.
- 5) Push the door drive shaft to the front of the door leaf and remove the remaining assembly, consisting of the steel drive shaft, drive gear and a thrust bearing and two hardened ground washers.
- 6) Remove the four inch brass bearing retainers (only if necessary) by removing the four center-bored cap head screws on each side. The ball bearing race is press fit into the brass bearing retainer and should only be replaced if excessive wear is apparent. These bearing retainer assemblies should be soaked in solvent and any traces of lubricants removed. Be sure to mark the position of each retainer assembly on both sides before removal. Re-assembly requires the use of the door drive center shaft for alignment.
- 7) Clean all components with solvent and polish the surfaces with a Scotch-brite pad. Clean the interior of the two inch bronze center bushing mounted in the door leaf panel and burnish with a fine sandpaper, if needed.
- 8) Follow the procedures listed in reverse to reassemble. Realign the drive gear and the gear rack on the latch bar with the indexing marks on both components for the proper door handle indexing arc. Lubricate the gear teeth with grease.
- 9) Adjust the tension on the door handle spindle assembly by tightening the caphead bolt on the rear handle to a point where the RF gasket is compressed for RF integrity and also so that the handle will have a slight drag. Tighten the locking setscrew on the door handle(1989modelonly). If the door handle does not have a set screw feature, it can be retrofitted by drilling with a #7 drill and tapping the hole with a 1/4"-20 tap for a 1/4"-20 set screw. The set screw will prevent the door handle from working loose.

## **5.0 LATCH BAR MAINTENANCE**

- 1) With the latch bar protective cover removed, remove the covers of the latchbar guide blocks and re-lubricate with a new application of a light grease.
- 2) Re-pack the ball bearing race on each center bearing with grease, mounted on the crossbars of the latch bar, at three locations.
- 3) Loosen the locking set screws, retaining the ball bearing cam followers at six locations, on the crossbars of the latch bar assembly, 1989 models. With a straight slot screwdriver or a hex drive, remove the six cam followers. Apply grease with a grease gun to the threaded stud end until new lubricant appears at the bearing end. Reassemble the cam followers and lock down the set screws.

## **6.0 HINGES ADJUSTMENT AND DOOR ALIGNMENT**

- 1) The door frame and leaf are factory aligned with precision jigs. The bolts securing these two components together (grade 8) with the heavy duty hinges are torqued to 80-100 inch-pounds. Under normal operating or shipping conditions, the assembly should NEVER become misaligned. If, however, some unusual or extreme conditions should occur, the factory should be consulted, BEFORE any corrective action is attempted.
- 2) The holes in the door leaf are bored oversize to allow the door leaf to move approximately 1/16th to the left, right, up and down. The realignment procedure is as follows: Loosen three of the four bolts securing the hinge plate to the door leaf with the door in the closed position. With blocks and pipe clamps, move the door leaf edge in the direction required. After repositioning the door leaf, re-tighten the remaining hinge plate bolts.
- 3) The Rulon hinge thrust bearings (89 models) have an anticipated life of five to ten years under normal conditions. If it becomes necessary to replace the bearings, work on one hinge at a time to maintain the proper alignment of the door frame and leaf. With the door in the closed position, and the handle in the locked position, remove the hinge plate from ONE of the hinge assemblies, by removing the eight hex-drive cap-head bolts. Release the tow locking set screws at the rear of each hinge arm, and remove the hinge arms and the hinge pin from the hinge base. With a small flat blade screwdriver, pry the Rulon bearings from the hinge base, discard, and replace. Reassemble the hinge assembly following these instructions in reverse order.
- 4) The older steel hinge assemblies (black) have two ball bearing sets in each hinges. With the door in the closed and locked position, remove ONE hinge assembly entirely from the door frame and leaf. The ball bearing races are press fit into the steel hinge barrel. Drive the bearing free with a drift pin, and replace. Repack the bearing with grease and reassemble.

Lindgren RF Enclosures provides repair and maintenance services across the United State to service our products and the products of others. For more information concerning this service, please direct inquiries to the Manager of Maintenance Services at the location listed below.

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7.0

**SPECIFICATION SHEET**  
**DOUBLE KNIFE EDGE**  
**RCM DOOR**

MANUFACTURED DATE: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_

CLEAR OPENING: \_\_\_\_\_ FT. X \_\_\_\_\_ FT.

NOTES: