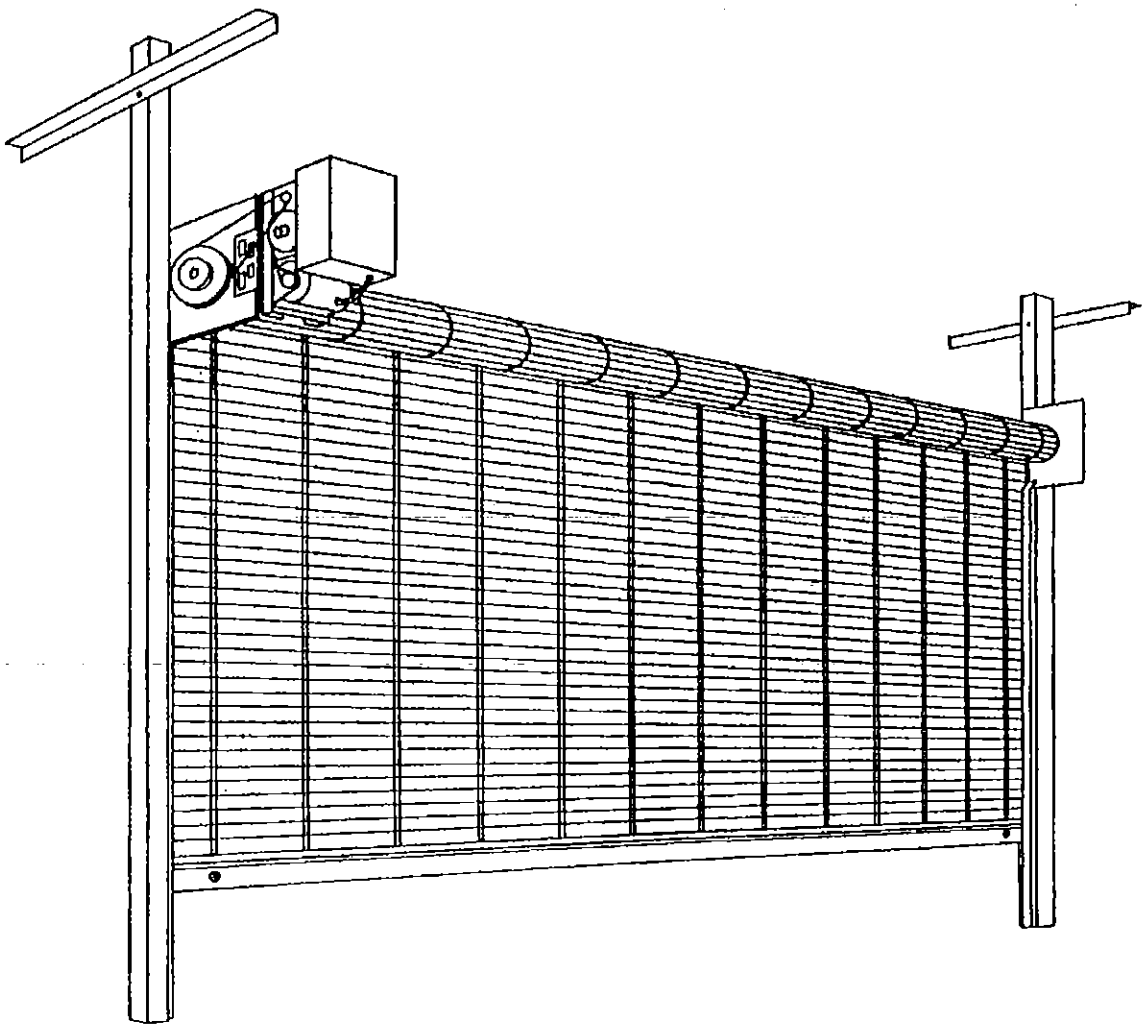
CORNELL IRON WORKS, INC.

Operation & Maintenance Manual

Products: Rolling Grilles



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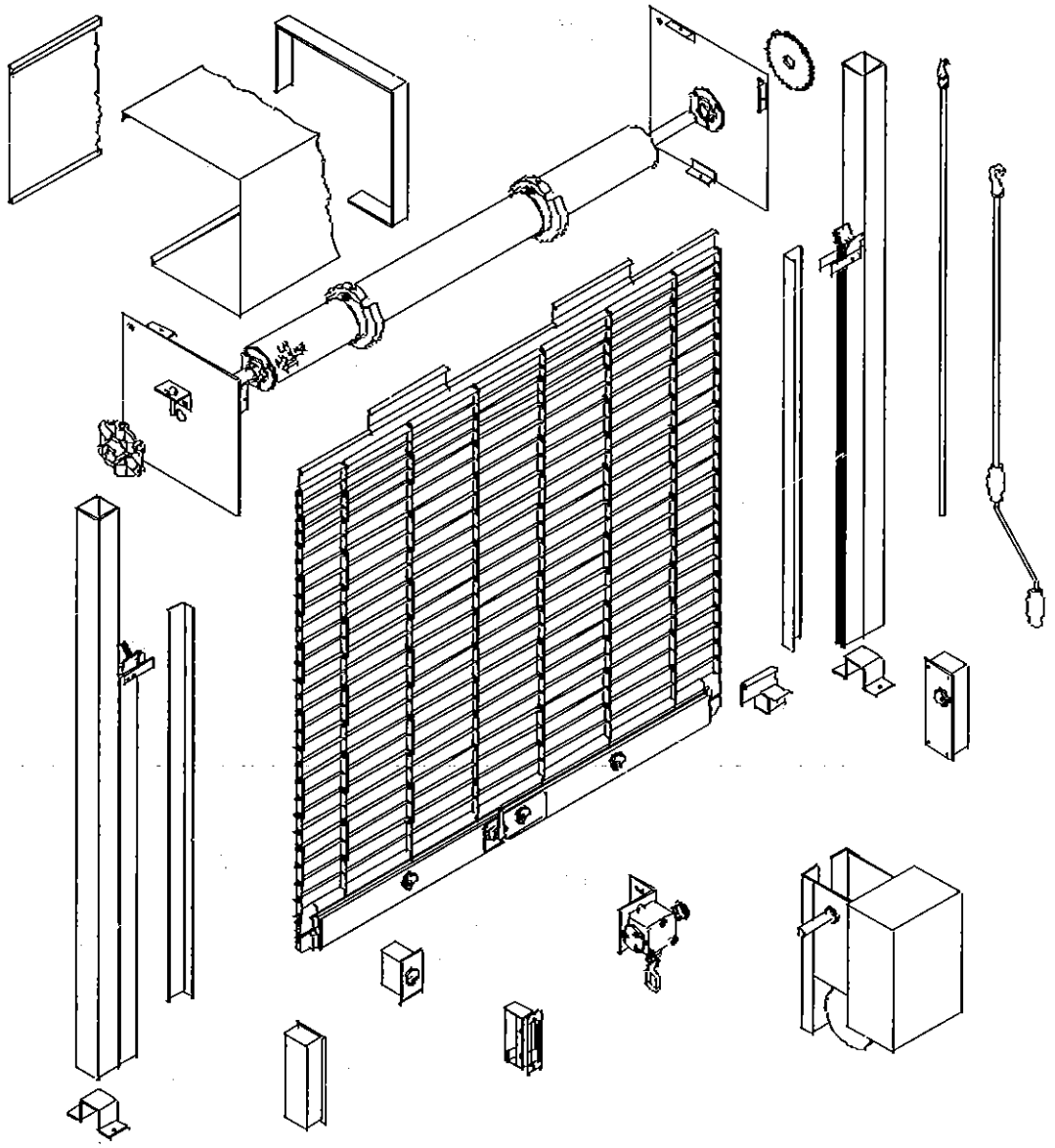
PARTS LIST - ROLLING GRILLES

PUSH-UP, HAND CRANK OR MOTOR OPERATION
LEFT HAND ADJUST SHOWN, FACING COIL SIDE



PRICES BASED ON STANDARD MILL FINISH ALUMINUM COMPONENTS. CONSULT FACTORY FOR OTHER FINISHES. PRICES MAY VARY ON GRILLES LARGER THAN 24'-0" X 12'-0". CONSULT FACTORY FOR LARGER SIZES.

1	LEFT HAND GUIDE	11	GRILLE CURTAIN	20	KEY SWITCH STATION (MOTOR OPER. UNITS)
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ROLLING GRILLES
INSTALLATON INSTRUCTIONS
(Push-up, Hand Crank or Motor Operated)

NOTE: Read all instructions carefully, checking shop drawings supplied for any special conditions. Open all crated materials and check with attached parts list prior to installation. All parts supplied should correspond with type of grille being installed.

STEP 1 Establish opening width and check against width shown on shop drawings, the two should correspond. Overall height dimension is taken from floor to underside of lintel or load bearing construction (supplied by others). In mall installations check with general contractor for lease lines. These will be your working points. Do not infringe with any part of the grille beyond these points. Also verify with G.C. finished floor line, as carpeting or other materials may be installed later and allowance must be made.

STEP 2 Locate your best level working point and set in place the left hand guide (1) and support tube (17) plumb and true. Support tubes are normally furnished in stock 20'-0" lengths and are to be fit or cut down if necessary at time of installation. Drill and fasten bottom saddles (18) to slab and top bracing angles supplied to lintel or load bearing construction above. Refer to shop drawings and set in place the right hand guide (2) and support tube (17), the distance shown on the drawing and level with the left hand guide assembly. Fasten to floor and structure above as on left hand guide assembly.

NOTE: On face of wall mounted installations a wall angle may be substituted for the support tubes and on certain between jambs grilles, a piece of steel flat is supplied behind the guides for alignment of brackets. Refer to shop drawings and fasten guide assemblies accordingly.

STEP 3 Locate a good hoisting point above the center of the opening and set in place a chain block. On larger grilles it is advisable to use two chain blocks.

STEP 4 Remove extruded aluminum guide sections from support tubes. Place the counterbalance barrel (4) at the base of the tubes. Check the markings on the barrel. The adjusting side will always be marked "L.H. or R.H. Adjust." Place barrel according to this mark. Left or right is always relative to the side you are installing on.

STEP 5 Hoist barrel 2 or 3 feet above the floor and install rings (5) when supplied. 4" diameter shafts will have holes drilled and tapped for ring studs. Larger diameter barrels will have holes drilled and tapped for direct attachment of curtain. 6" diameter shafts will use either rings or direct attachment. (Take note of the direction of the coil to insure installing the ring in the proper direction, **Ref. Stamped Ring Installation**). Next place the adjustor bracket (7) on the adjusting side of the barrel. This bracket is recognizable by a welded angle section above the center hole. (On grilles without support tubes the adjustor bracket will have a lug with a hole.) Place the adjusting wheel (9) on the barrel. Do not insert adjustor pin (10) at this time. (Grilles that have a lug on the adjustor bracket will use a barrel with an "inside" adjusting wheel already pinned to the shaft.)

STAMPED RING INSTALLATION - S52A & S178A

STEP 1 Locate the steel rings in the hardware package supplied with the unit. Determine the ring type by referring to the shop sheet and follow the chart below:

S52A Large Ring - 4-1/2" Lever Arm (Stamped Steel)

S178A Large Ring - High Cycle Usage Only - 4-1/2" Lever Arm (Stamped Steel)

STEP 2 The shaft assembly will be provided with tapped holes plainly marked with a white circle indicating the location of the rings placement.

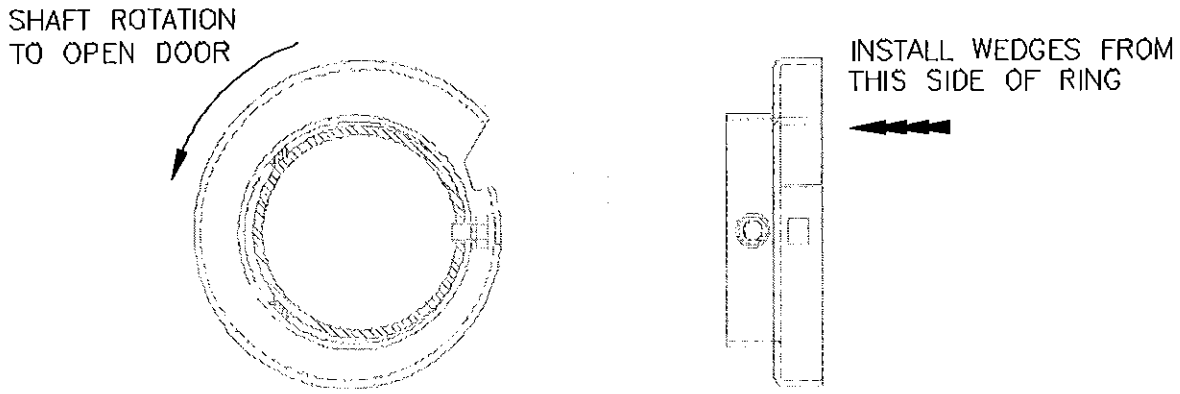
STEP 3 Assemble the 3/8"-16x3/4" lg. square neck bolt into the square hole located on the outer lip of the ring. (It is recommended to assemble a nut onto the screw temporarily to hold it in place until the ring assembly is completed. Bolt head on underside, the nut on outside).

STEP 4 Next, assemble the rings onto the shaft by sliding them over and down to the proper position. Note the ring relationship to the direction of shaft rotation. Thread the 3/8"-16x1/2" lg. screw, with the nylon patch, along with the 3/8" I.D. lock washer, thru the hole in the ring then into the tapped holes in the shaft, just until snug.

STEP 5 It will be necessary to locate and use the "serrated" wedges supplied as shims to take up the "play" in the rings. Refer to the drawing above for the proper positioning of the wedges.

STEP 6 Using a hammer, assemble the wedges to the ring/shaft assembly. (It will be necessary to re-align the ring as the wedges are being applied.)

STEP 7 Once the rings and wedges are assembled tighten the 3/8"-16x1/2" lg. screw.



STEP 6 Place the operator bracket (8) on the opposite end of the barrel. On push-up grilles with support tubes this bracket will have a center hole only, for push-up grilles without support tubes it will have a lug, and for all grilles with operators it will have a roller bearing (8A). If applicable place the sprocket (28) on the shaft.

NOTE: If one or both brackets have lugs, the bracket(s) should be bolted in place, the barrel raised and extended shafts placed in the lugs.

STEP 7 Sling and hoist the above assembly and bolt brackets to existing holes supplied in support tubes. It is important to fasten brackets rigidly. On under lintel installations, the top of the brackets may have bent returns for extra fastening to load bearing construction. Intermediate holes or braces for support tubes are also supplied for jamb fastenings on large grilles.

NOTE: On hoods with more than one section, a hood support. It is advisable to locate and drill hood support fastening holes prior to installing curtain, (**Step 8**). The support is centered between the brackets. If more than one support is required, layout should be checked relative to length of hood sections supplied.

STEP 8 Position rolled curtain at base of guides (note direction of coil) and remove protective covering. Extra care should be taken to protect aluminum material or special finishes (utilize packing materials the grille is shipped in). Attach hook from the chain block to third rod down on the curtain assembly as close as possible to one of the rows of vertical links to avoid damaging the horizontal rods. On large grilles it is advisable to use two chain blocks to distribute the weight of the curtain. Hoist curtain up to barrel.

NOTE: The location of the chain from above should be behind the barrel towards the wall. If conditions do not permit the above it will be necessary to re-roll and raise the curtain in the rolled position with the bottom bar on top. Raise curtain and sling with rope at two or more points. Unleash sling from chain block. The curtain is now cradled in the rope slings. Grasp bottom bar and raise over rings and slowly lower curtain.

STEP 9 (**Ref. Stamped Ring Installation**) Position top slat (11A) onto rings (5). Ends of slats should be equally distant from either bracket. Mark position of studs on slat and drill a 3/8" diameter hole (on larger barrels no rings are supplied and the pipe will be drilled and tapped for slat attachment.) Secure top slat to rings with hardware supplied. If barrel is supplied with cast iron rings they must be spaced evenly and aligned properly between the vertical link chains of the curtain assembly to allow the curtain to roll up smoothly.

STEP 10 Insert a round bar approximately 2 feet long into the topmost hole in the adjusting wheel (9). Pull bar down and away from wall and insert adjustor pin (10) through angle welded to bracket and into hole in adjusting wheel to hold the spring tension applied. For grilles with an inside adjustor wheel (**Ref. Step 5**), torque must be added with curtain fully closed. As torque adjustments are made, the adjustor pin must be inserted through the holes in lug and shaft to maintain the torque. Repeat this procedure until the amount of turns applied matches the amount marked on the barrel. On large grilles it is advisable to apply tension and raise curtain alternately until full spring charge is applied.

STEP 11 Raise curtain to stopper height, and secure temporarily. Remove stoppers (19) from guide assemblies, then set the guide members back into place and bolt securely to support tubes. Add "flare" to top of each guide, four places, as shown on (**Ref. Parts List**) at this time. Replace stoppers on guides to restrict bottom bar from running up into the coil area. Remove clamps from curtain. Do no install snap-on guide trim (3), if supplied, until completion and checking of installation.

STEP 12 Fit and align roller chain on crank or motor operated grilles and check curtain for ease of operation. Final spring adjustment, if required, should be added or released at this time with the curtain in the fully open position. Carefully remove the adjustor pin using the two foot round bar inserted into the hole in the adjusting wheel. To increase spring tension turn wheel in the direction of raising the curtain, inserting the adjustor pin after each turn. To decrease spring tension, wheel will turn in the direction of lowering the curtain. Never add more than one full turn of spring tension. Use caution in the above procedure.

STEP 13 The sheet metal hood (15), when supplied should be installed after the grille is checked for ease of operation and proper clearances. Hood parts may consist of a hood, fascia and soffit or any combinations of sections as

determined by the type of installation. On hoods with more than one section, a hood support (16) is supplied. (**See Step 7**). Attach hood parts to clip angles (brackets) with sheet metal fasteners supplied.

STEP 14 One of three types of locking devices may be provided: Bottom bar mounted locking, curtain mounted locking or guide mounted locking assemblies. (**Ref. Step 1**). The final finish floor line must be verified with general contractor in order to achieve proper adjustment for lock engagement in the guides. Also, guide mounted interlock devices to be used with bottom bar and curtain locks are provided on motor operated units. (**Refer to Interlock Switch Instructions**). Guide locks include interlocks when required. The bottom bar locking device required installation of a lock strike in the guides (packaged in hardware) with self tapping bolts supplied. The curtain lock required 1/2" diameter holes drilled through the back of the guides (including support tube, flat or wall construction) on push-up or crank operated grilles. On motor operated grilles, the lock holes are factory located. Guidelocks to be installed on guides with machine screws provided. Holes are factory set. Operation of bottom bar locks and guidelocks require only rotation of the key in the cylinder. Operation of curtain lock: To lock, manually throw (slide) rods back into hole(s) in guide(s), no key is required. To unlock, insert key and turn 360 degrees (one full turn) clockwise, rods will automatically retract to unlocked position. If spring tension of grille is too strong (tends to lift grille) it may be necessary to pull down curtain to relieve pressure on lock rods until they retract.

INTERLOCK SWITCH WITH BOTTOM BAR LOCKS FOR USE WITH - AR183 & AR184

NOTE: Read these instructions and use in conjunction with detail drawing for proper mounting and operation of interlock switches.

Interlock switches (AR183 for recessed guides and AR184 for exposed guides) are shipped in pairs, separate from guides, and must be mounted in field. For ease of installation and adjustment interlock switches can be mounted to guides before tubes and guides are installed.

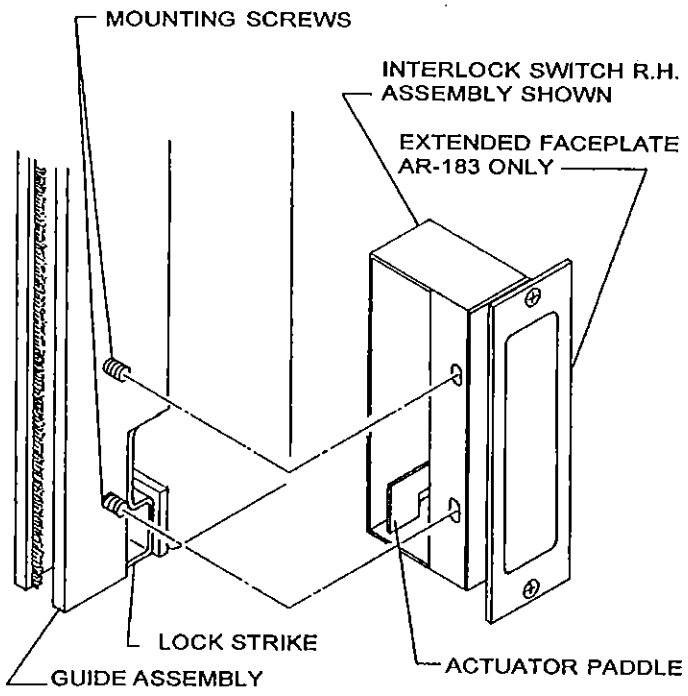
To install interlock switches remove 1/4-20 hex nuts from captive screws in bottom of guides and remove faceplates from interlock switches. Slip actuator paddle, on interlock switch, into slot in guide behind the lock strike and slide the box toward guide until 1/4-20 screw project through slotted holes inside of box; replace 1/4-20 hex nuts on screws.

IMPORTANT: INTERLOCK SWITCH ADJUSTMENT

If necessary the switch paddle may be adjusted upward by loosening the two screws on the mechanism with an 11/32" wrench or a pair of pliers and sliding the mechanism upward. The lock strike may be adjusted by loosening the screw in back of the guide and sliding upward.

After mounting switches and adjusting the lock strike and/or paddle check interlock to be sure switch is not already in tripped position. Insert a pencil or screwdriver through slot in lock strike depressing the actuator paddle of switch and listening for the switch to click.

After the unit is completely installed the curtain should be brought down to fully closed position and checked to see that the bottom bar locks trip the interlock switches in the locked position.



INTERLOCK SWITCH WITH CURTAIN LOCKS
FOR USE WITH - AR181 & AR182

NOTE: Read these instructions and use in conjunction with detail drawing for proper mounting and operation of interlock switches.

Interlock switches (AR181 for recessed guides and AR182 for exposed guides) are shipped in pairs, separate from guides, and must be mounted in field. Guides are pre-drilled and tubes are slotted for mounting switches. Screws and nuts for fastening interlock switches should already be in place in guides.

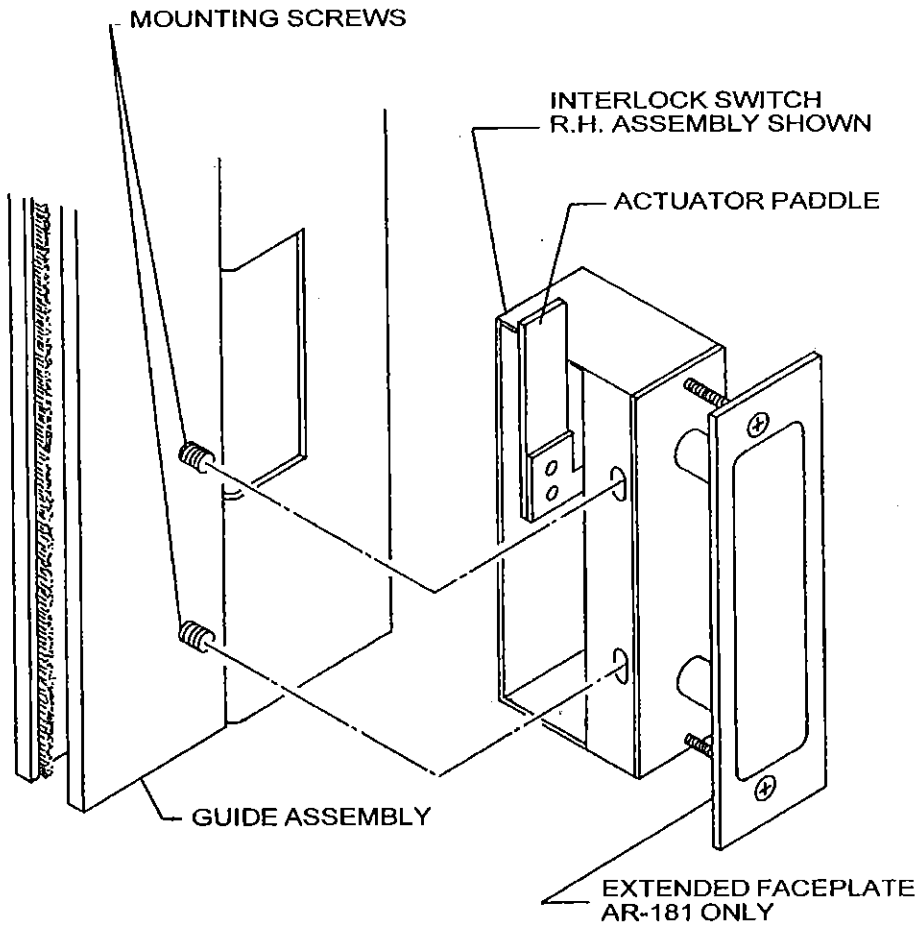
Guide assemblies should be mounted to support tubes using self tapping fasteners supplied with hardware package. For ease of installation and adjustment, interlock switches can be mounted to guides before tubes and guides are installed.

To install interlock switches, remove 1/4-20 hex nuts from captive screws in bottoms of guides and remove faceplates from interlock switches. Slip actuator paddle on interlock switch into slot in tube behind guide assembly and slide box toward guide until 1/4-20 screws project through slotted holes inside of box, replace 1/4-20 hex nuts on screws, center actuator paddle on slot in back of guide and tighten hex nuts. If necessary switch paddle may be adjusted upward by loosening the two screws on the mechanism with an 11/32" wrench or a pair of pliers and sliding the mechanism upward.

IMPORTANT: INTERLOCK SWITCH ADJUSTMENT

In some cases slight adjustment to actuator paddle may be required. After mounting switches to guides check interlock to be sure switch is not already in tripped positiion. Insert a pencil or screwdriver through slot in back of guide, depress actuator paddle of switch and listen for switch to click. If clicking sound is not heard actuator paddle may be bent too far forward causing false tripping of switch. Remove switch assembly from guide, carefully bend actuator paddle toward back of box 1/16" or so and install switch back on guide and recheck. Tighten hex nuts to secure box to guide and replace faceplate.

After unit is completely installed curtain should be brought down to fully closed position and checked to see that curtain lock trips interlock switches in locked position.



INSTALLATION INSTRUCTIONS FOR USE WITH G57A GUIDELOCKS

NOTE: Read these instructions and use in conjunction with detail drawings for proper mounting guidelocks. Guidelocks are shipped in pairs, separate from guides, and must be mounted in field. For ease of installation guidelocks can be mounted to guides before tubes and guides are installed.

STEP 1 To install guidelocks remove the four oval head screws from the corners of the guidelock cover plate.

STEP 2 Unlock the guidelock and pull the cover plate assembly straight out to remove lock.

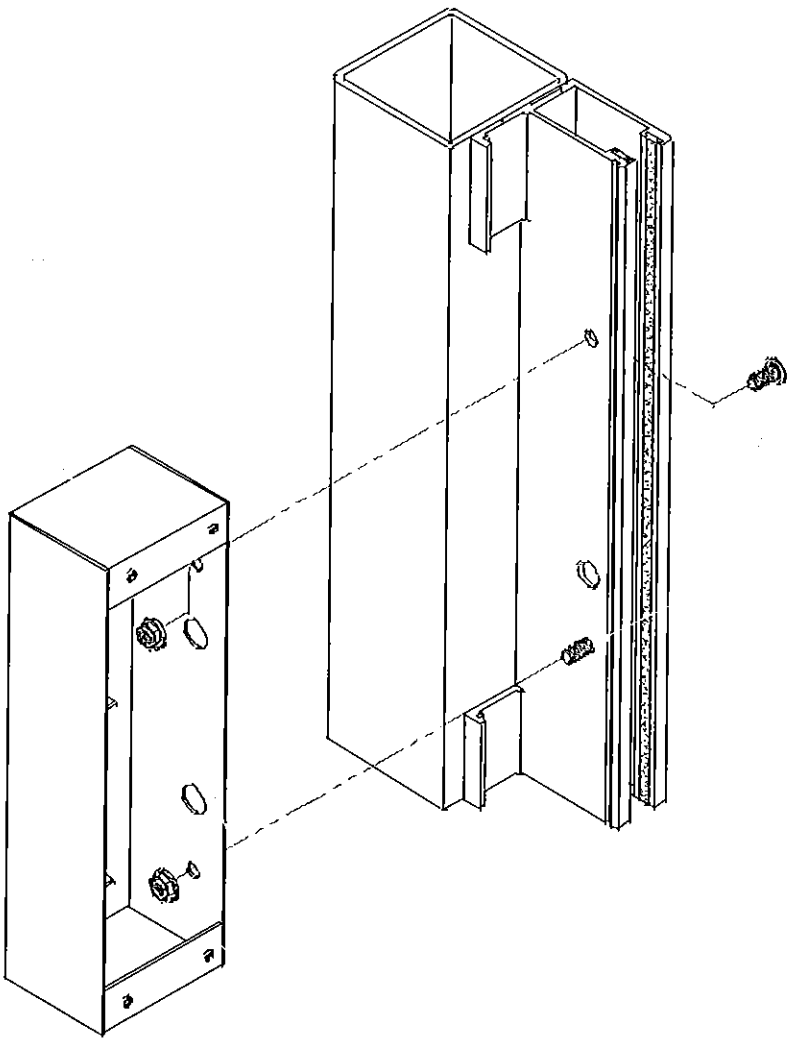
NOTE: Cover plate cannot be removed with the guidelocks in the locked position.

STEP 3 Remove the hex locknuts from the rib necked mounting screws already installed in the sides of the guides. Slide screws in guides thru pre-drilled 9/32" holes in side of box, spin nuts on screws and carefully snug with a wrench. Be certain heads are drawn tightly against inside wall of guide to prevent any interference with curtain. Over tightening these screws may strip out holes in guide.

NOTE: Guidelock must be fastened directly to side of guide. Shimming or spacing box out away from guide will decrease lock pin projection into guide and unit may not lock properly.

STEP 4 Replace the coverplate assembly on guide lock box and fasten with four cover screws. Insert the key into lock cylinder and check operation of lock.

STEP 5 When electrical interlocks are required connect both switches mounted to locks in series to terminals marked "External Interlocks" on diagram for motor operator. This feature cuts power to the motor control circuit when units are in the locked position to prevent damage to curtain or guidelocks.



Right hand fascia side mounting shown, coil side similar

ROLLING GRILLES

Motor Operated Grilles Are Operating Correctly When:

- Grille runs to full open position and shuts off without slamming against upper guide stops.
- Grille runs to full closed position and stops without buckling; bottom bar should make adequate contact with the floor.
- Safety bottom edge stops or reverses grille travel when tested as grille is closing.
- Functions of all control stations work properly (open, close, and stop).
- Grille does not drift more than 6 in. when stop button is depressed while grille is closing and at middle of travel.
- Grille operates full cycle without catching or binding.
- Grille is level in open and closed position.
- Emergency hand chain on operator raises and lowers grille adequately (use only in emergencies; do not run grille for long periods through the emergency hand chain).
- Emergency disconnect on operators allows grille to be manually raised or lowered.

Manual Grilles Are Operating Correctly When:

- Grille stays open without drifting down.
- Grille balances in closed position or has slight lift.
- Grille operates without excessive force to lift (less than 25 pounds).
- Grille operates full cycle without catching or binding.
- Grille is level in full-open and full-closed position.
- No excessive component wear exists.

SUGGESTED LUBRICANTS	
To Lubricate:	**Use:**
Roller Chains	Roller chain lubricant with penetrating agent. Available in spray cans.
Spur Gears	Open gear lube designed for spur gears having a tacky consistency. Available in spra cans.
Wear Points on Guides, End Brackets, also for Endlocks.	Parafin based lubricant in stick form or spray dry grphite lubricant.
Bearings with Grease Fittings.	Multi purpose grease.
Lock Mechanisms, and Stub Shafts	General purpose lubricant in spray form.

GRILLE MAINTENANCE STEPS

Improper maintenance procedures can damage a good grille and injure the technician doing the work. The "Grille Maintenance Steps" lists recommended procedures for keeping a grille performing at its maximum.

1. Inspect grille for alignment, level, and proper working clearances.
2. Check curtain for damaged, missing clips or wear.
3. Check curtain attachment to shaft. Inspect bracket for secure attachment. Check inside of bracket for curtain rubbing. Adjust curtain and lubricate end brackets at wear points.
4. Examine manual chain or crank mechanisms for alignment or wear, tighten set screws, lubricate stub shafts, gears, and roller chains.
5. Inspect guides for damage, obstructions, secure attachment and slipping or missing anti-friction inserts.
6. If there is finish construction around the grille, check to see that it does not interfere with grille operation.
7. Check the operation of the locks and cylinder. Tighten cylinder locking set screws, and lubricate the lock mechanism.
8. Operate grille while closely watching curtain movement. Correct any deficiencies which cause the grille curtain to catch or snag.
9. Test operation of the emergency exit system if the grille has one.

For motor operated grilles refer to the motor maintenance section.

GRILLE CURTAIN TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	SOLUTION
Handle is pulled down but grille curtain does not open automatically.	1. Excessive slack in release cable.	1. Tighten turnbuckle to remove slack and tighten jam nut on turnbuckle to prevent re-loosening.
	2. Elbow at motor assembly rotating when handle is pulled.	2. Tighten fitting securely to prevent rotation when handle is pulled.
	3. Cable slipping at cable clamps.	3. Tighten screws on clamps to prevent slippage.
	4. Pins in disconnect sprocket not fully disengaging from drive sprocket in motor assembly.	4. Tighten turnbuckle to allow approximately 1/8" gap between disconnect and drive sprockets.
	5. Cylinder locks supplied on unit not in unlocked position.	5. Unlock cylinder locks.
	6. Motor operator not braced properly, allowing excessive slack in cable.	6. Check outboard bracing of motor and tighten all fasteners.
Handle is pulled down and grille curtain opens but ringing or clicking sound is made by motor.	1. Pins in disconnect sprocket contacting face of drive sprocket in motor assembly.	1. Tighten turnbuckle to allow for full disengagement of disconnect and drive sprockets.
Grille cannot be operated electrically after automatic opening by pull handle.	1. Pull handle still in release position.	1. Return handle from released position to re-engage disconnect mechanism.
	2. Interlock switch in control panel or motor not re-energizing control circuit.	2. Adjust actuating arm on interlock switch in motor control panel to re-energize control circuit when handle is released.
Grille curtain opens only a short distance above floor and stops.	1. Not enough spring tension.	1. Add additional spring tension to adjusting wheel.
	2. Drive chain from motor to door shaft to tight causing excessive amount of friction in drive.	2. Loosen motor mounting screws and provide slack in drive chain.
	3. Large or very heavy curtain construction will not allow grille to open fully.	3. Curtain must be pushed up the remaining way by hand.

INSTALLING MOTOR OPERATORS

Most motor operated grilles use bracket mounted operators. Refer to shop drawings to verify motor mounting position. The grille operator bracket is pre-drilled to match the motor mounting plate or mounting angle. Hoist and bolt motor in place. Fit and align chain around sprockets. Cut chain to size (with a chain breaker if available), adjust for correct chain tension and tighten bolts securely. It is important to use lock washers supplied. Install bracing angles supplied for additional motor support. Refer to shop drawings for bracing arrangement required. The operator must be mounted securely to prevent movement during operation. Wall mounted motors are supplied with a pre-drilled mounting angle to match holes in guides and motor base. Use the angle to layout the "outboard" holes for motor mounting to wall construction. Drill and insert expansion shields for masonry construction. Substitute proper fasteners for other wall construction. Hoist and bolt motor in place. Refer to above for chain adjustment, etc.

Refer to motor operator manufacturer's instructions for additional information.

MOTOR OPERATOR MAINTENANCE

Operators require practically no special maintenance other than periodic checking to see that mechanical parts where necessary are lubricated and the electrical compartments are clear of dirt.

Service technician should first familiarize himself with proper sequence of operation of operator and all related controls. Power to operator must be shut off when removing or replacing covers on electrical components, making adjustments, or performing maintenance.

1. Check wire connections for tightness and wire insulation for defects of abrasions.
2. Check to see that all conduit connections are secure.
3. Check wires to safety edge if unit is equipped with a safety to reverse feature.
4. Inspect, align and adjust V-belt. (belt operator)
5. Check pulley clutch mechanism for slippage. (belt operator)
6. Inspect operation of brake. (gear operator)
7. Inspect gearbox for leaks. (gear operator)
8. Inspect roller chain and drive sprockets. Align, lubricate the sprockets and tighten the set screws. Adjust chain tension.
9. Generally inspect the motor mounting, and tighten the fasteners and bracing.
10. Test the operation of the emergency disconnect or hand chain mechanisms and lubrication the friction points.
11. Check the disconnect cutoff switch for correct mechanical and electrical operation.
12. Verify that all conduit connections are tight and have no exposed wires.
13. Inspect the wiring panel for debris, arching or moisture. Check for and tighten loose wiring connections.
14. Test motor operation through all control stations.
15. Check limit switch setting.
16. Examine safety edge, coil cord and take up reel for damage.
17. Test the operation of the safety edge.
18. Check motor aperage draw for a full open and close cycle. Compare readings to those listed on the amperage table.
19. Inspect and test track mounted lock cutout switches for correct mechanical and electrical operation.

M7A MANUAL RELEASE SYSTEM

STEP 1 Install Grille according to standard installation instructions, but do not fasten curtain to pipe or wind spring tension on adjusting wheel at this time.

STEP 2 Fasten cable guide mounting plate to motor and assemble as shown in attached details. Fasten motor operator to mounting plate, and mount to end plate bracket or grille in location shown on shop drawings.

NOTE: In some mounting arrangements, both cable guide plate and motor mounting plate will be fastened through the same holes in motor base plate.

STEP 3 Install sprocket on gear end shaft at operator bracket with hub away from end bracket. Align this sprocket with small drive sprocket on motor and install roller chain.

NOTE: For proper automatic operation of grille, roller chain should not be excessively loose or tight and must be aligned properly.

STEP 4 Remove cover and backer plate from pull handle box and mount to tapped holes provided in face of guide support tube as shown on guide detail supplied with shop drawings. Replace cover and backer plate on pull handle box.

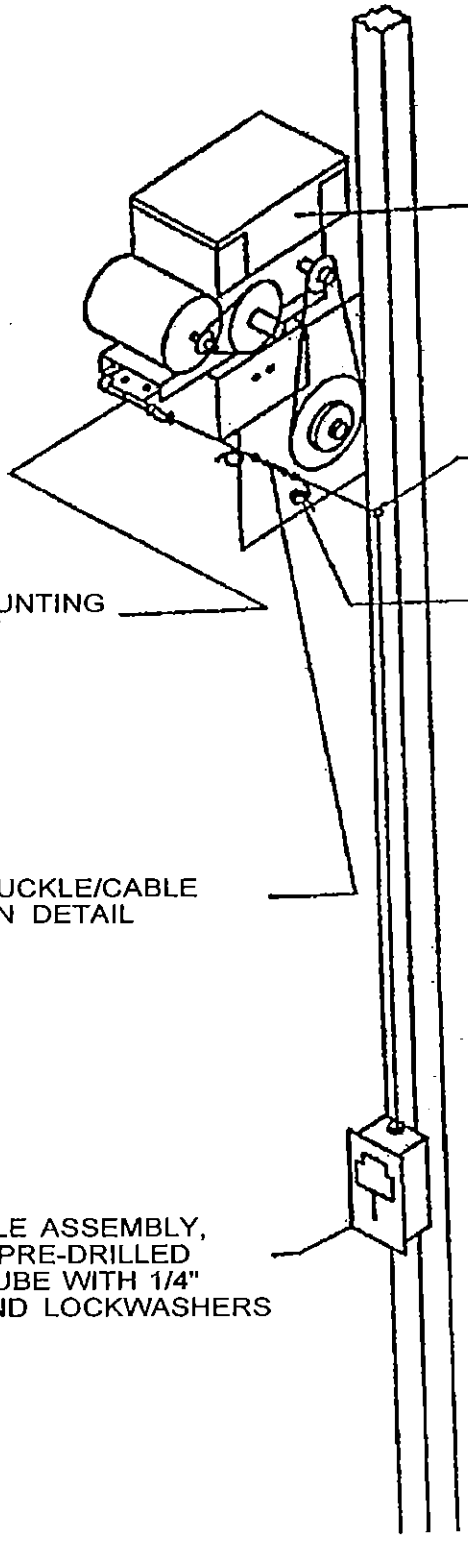
STEP 5 Route actuating cable so it does not interfere with drive chain on motor or grille curtain coiling up. Hardware package is provided with eyebolts and nuts which can be mounted to support tubes or other structure to route cable around any obstacles. Connect ends of cables together as shown on attached detail sheet and remove slack before tightening cable clamps. Once cable is secured, check sprocket disconnect mechanism inside motor assembly to see that approximately 1/8" gap is allowed between disconnect and drive sprocket with pull handle in up position. Pull release handle down and latch in place. Check disconnect mechanism again to see that pins in disconnect sprocket are completely clear of drive sprocket. If adjustment is required, cable can be tightened or loosened by adjusting turnbuckle at cable connection.

NOTE: Jam nut on turnbuckle must be tightened after adjusting to prevent cable from loosening and causing release to malfunction.

STEP 6 Fasten curtain assembly to pipe shaft at this time and wind spring tension on adjusting wheel so grille curtain opens to a minimum of 6'-8" high or to the full open position when handle is pulled down. **NOTE:** When grille is very large or very heavy curtain construction is used, this may be possible and curtain may raise only a few feet above floor requiring curtain to be pushed up by hand the remaining distance.

NOTE: Springs are designed to open grille automatically for emergency exit and cannot be adjusted for easy push-up operation. If the grille must be locked prior to wiring, the motor curtain should be closed by moving release handle to down position and pulling curtain assembly to floor until it begins to sag at the bottom bar, and then releasing pull handle to re-engage motor drive. By doing this, grille can be locked without damaging locks or exerting pressure on lock assemblies which would make it difficult to throw or retract locks. When motor is supplied with auxiliary hand chain operator, grille can be operated by engaging hand chain operator and closing grille to floor.

M7A RELEASE DEVICE



MOTOR ASSEMBLY SHOWN MOUNTED HORIZONTALLY, OTHER MOUNTINGS SIMILAR

EYEBOLT, LOCATE AS REQUIRED TO GUIDE CABLE

SEE CABLE GUIDE MOUNTING PLATE ARRANGEMENT

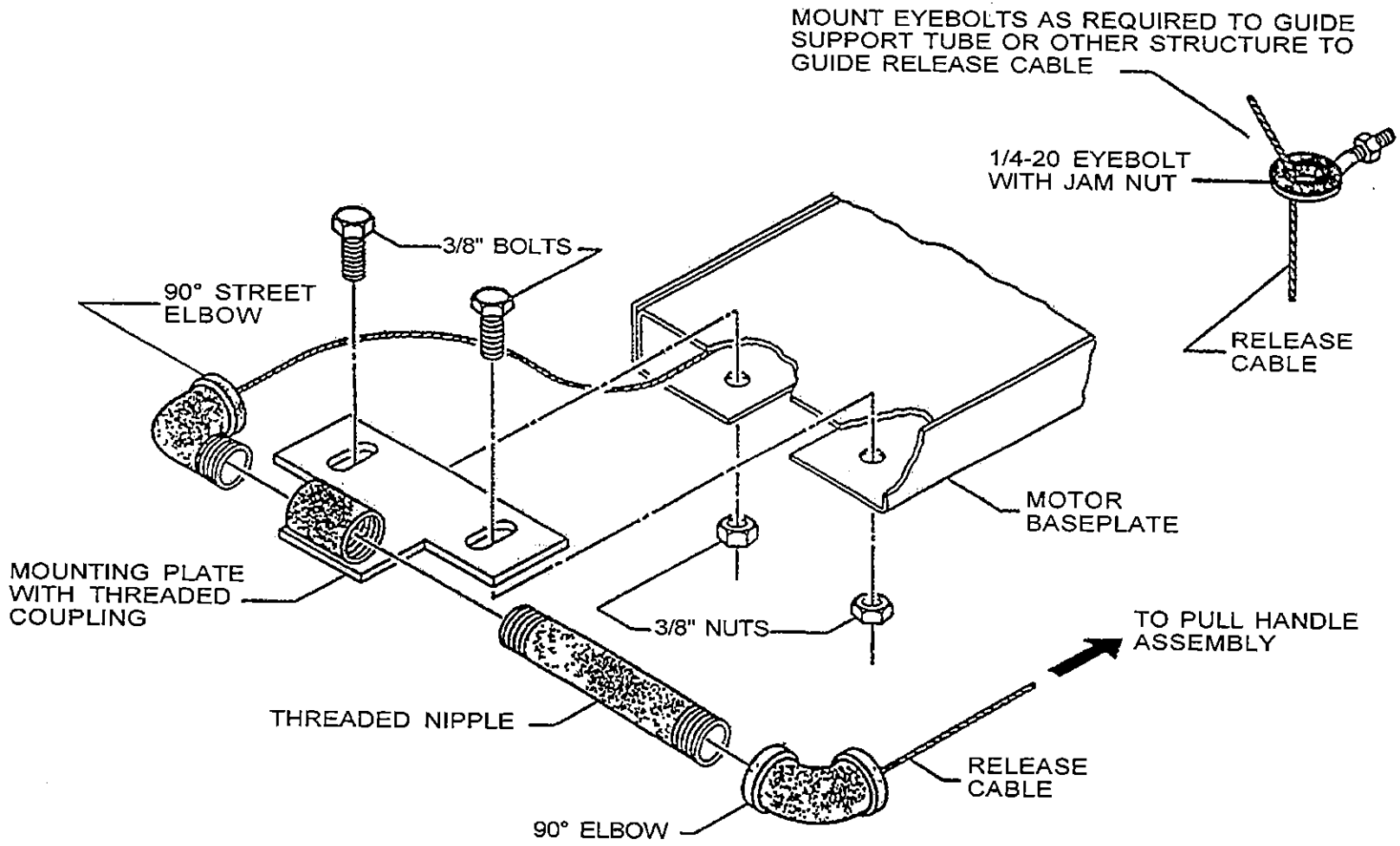
DO NOT CUT OFF EXCESS CABLE. PULL UP AND FASTEN FOR POSSIBLE RELOCATION OF PULL HANDLE

SEE TURNBUCKLE/CABLE CONNECTION DETAIL

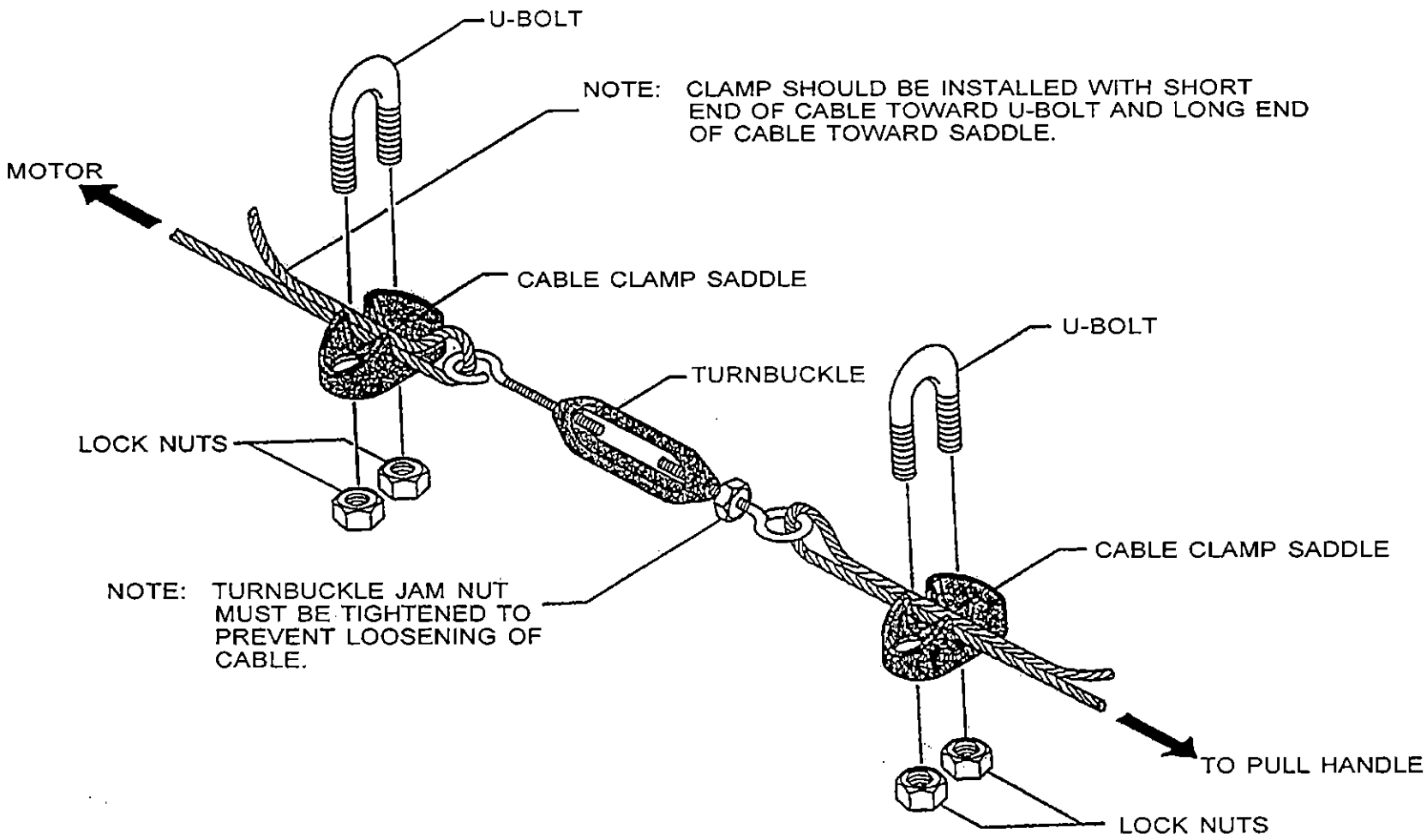
PULL HANDLE ASSEMBLY, MOUNT TO PRE-DRILLED HOLES IN TUBE WITH 1/4" SCREWS AND LOCKWASHERS

NOTE:

CORNELL IRON WORKS IS NOT RESPONSIBLE FOR RELOCATION OF PULL HANDLE, STRUCTURE REQUIRED FOR MOUNTING, OR OPERATIONAL PROBLEMS CAUSED BY IMPROPER RELOCATION



CABLE GUIDE MOUNTING PLATE ARRANGEMENT



TURNBUCKLE/CABLE CONNECTION DETAIL

OPERATORS TROUBLE SHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	CURE
Motor does not run when OPEN or CLOSE button is pushed.	Circuit breaker tripped or power fuse blown.	Check circuit breaker, power fuses, safety switch; check cause.
	Thermal overload tripped.	Reset; check cause.
	Manual interlock switch open. (on units with emergency operator)	Shift into MOTOR operation.
	Note: Operate contact on start by hand. If motor runs, cause is in control circuit.	Check pushbutton wires. Check wiring to the manual interlock.
	External interlock open. (if supplied)	Close interlocks.
Motor runs but door does not move.	Sprocket key missing or drive chain broken.	Check drive train for operation.
	Clutch slipping. (if furnished)	Adjust clutch.
Motor hums but does not run.	Door jammed. Drive train jammed.	Check door. Try to operate manually.
	Dead phase in 3 phase system.	Check power supply.
	Brake does not release.	Check power to brake solenoid.
	Open motor winding.	Check all motor connections.
Operator runs in wrong direction and limits do not function.	On 3 phase operators power supply is out of phase.	Interchange any 2 power leads to unit.
	Note: All units are checked for proper rotation at factory. Limit switch adjustment instructions in limit housing indicates proper direction of travel for OPEN and CLOSE limit nuts.	
Limit switches do not hold their setting.	Drive chain loose allows chain to jump sprocket teeth.	Adjust chain to proper tension.
	Limit nut retainer not engaging slots in limit nuts.	Be sure retainer is in slots of BOTH nuts.
	Limit nuts binding on screw threads which allows them to jump position on retainer.	Lubricate screw thread. Limit nuts should turn freely.
Door 'drifts' when motor shuts off.	Brake inoperative or improperly adjusted.	Check brake operation. Check solenoid.
Operator does not shut off at full OPEN or at full CLOSE position.	Limit nuts not properly adjusted.	Adjust. (see above)
	Sprocket on limit shaft loose or limit drive chain broken.	Tighten set screw. Replace chain.
	Defective limit switch.	Operate limit switch manually to determine.