

STORAGE & HANDLING

The handrails are shipped unassembled. Upon receipt, immediately check all material for any damage that may have occurred in transit and verify that all of the items and quantities are correct. The handrail covers should be stored in the horizontal position at room temperature (65 - 75° F). This is a finished product; store in a protected, clean, dry area away from direct sunlight. **DO NOT WALK ON THIS PRODUCT OR STORE ANYTHING ON TOP OF IT.**

Check to ensure the anchors supplied by the factory will work with the type of wall substrate on the project.

CUTTING

All materials are supplied in stock 12' lengths and are to be field cut using quality equipment to insure that all cuts are square. When cutting materials Nudo recommends using a 80-100 tooth carbide tipped saw blade or equivalent. **NOTE:** Stock Length material does not always have squared ends and may require squaring in the field. If space is available use a minimum 12' long cutting bench to allow the installer to cut the material without having to turn it around.

IMPORTANT!

The factory recommends using back up channels at stud wall conditions (see Page 3, Figure 2).

SPLICES

When splices occur (runs over 12'-0"), always splice the aluminum retainers, vinyl covers, and impact bumper at different locations along the run. The minimum required spacing between the splice locations is 6" (See Page 2, Typical Layout).

HANDRAIL COMPONENTS AND HARDWARE



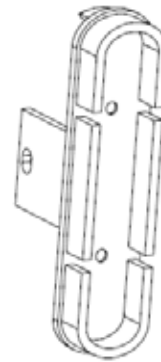
ALUMINUM RETAINER



IMPACT BUMPER



HANDRAIL COVER



END CAP AND CORNER INSERT



TOGGLE ANCHOR



1/4-20x3" Phillips Head Fastener



#8 Self Tapping Screw



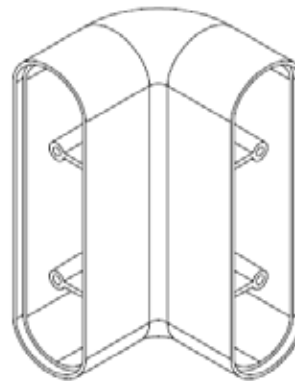
LOCKTIGHT STANDOFF



LOCKTIGHT INSERT



LOCKTIGHT PIN



END CAP AND CORNER HOUSING



1/4-20x3/8" Button Head Fastener

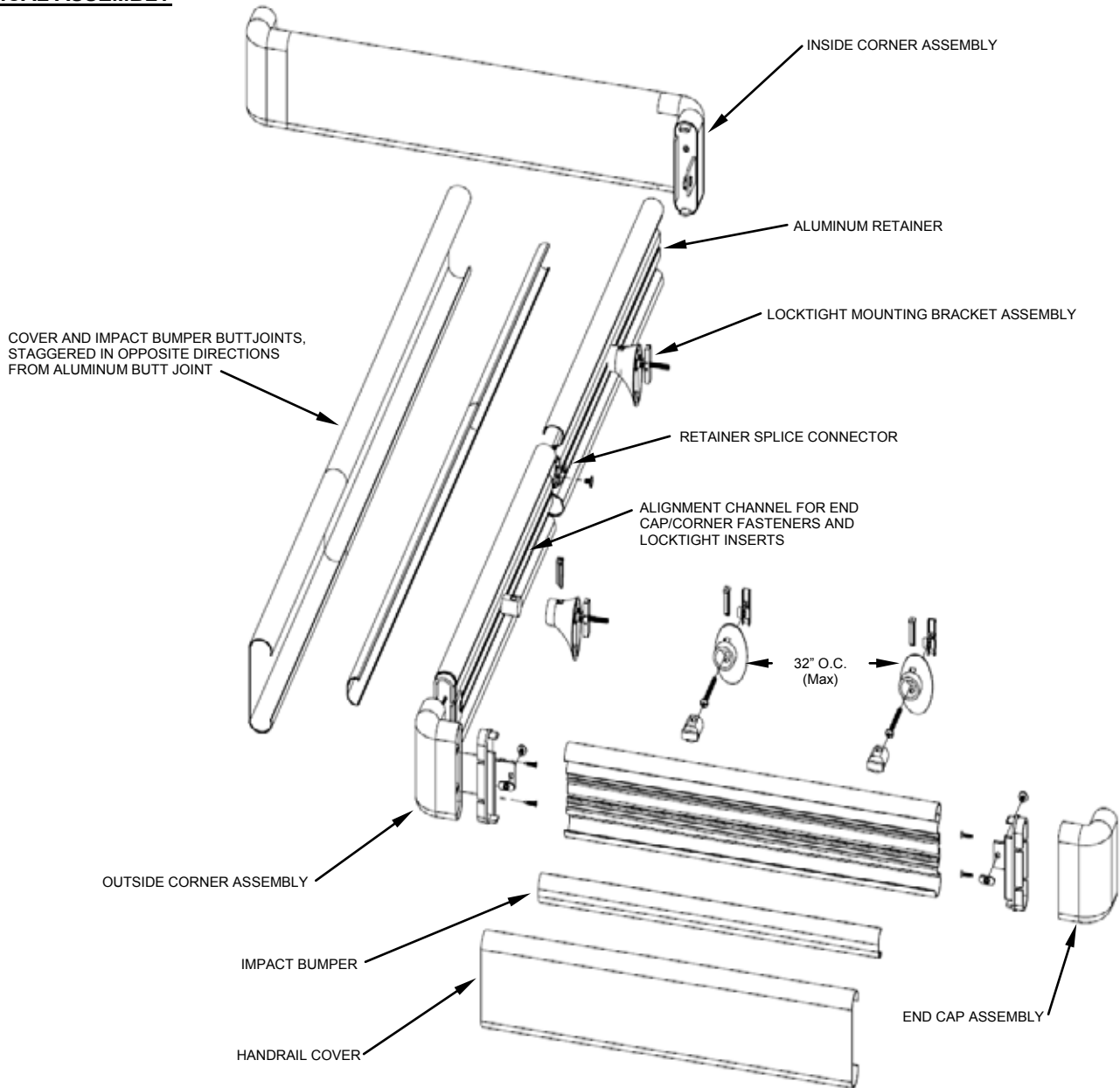


1/4-20 Slot Nut



ALUMINUM RETAINER SPLICE

TYPICAL ASSEMBLY



TOOLS REQUIRED FOR HANDRAIL ASSEMBLY

Level
Chalk Line
Tape Measure
Phillips Screw Driver
Compound Mitre Saw with an 80-100 tooth carbide blade
Drill
1/4" Drill Bit
1/2" Drill Bit

Note: Drill bit sizes may differ for Masonry and other substrate applications, see instructions on the appropriate fasteners for the substrate (provided by others).

HARDWARE DETAILS

End Cap and Corner Assembly:

#8 Self tapping screw
1/4-20x3/8" button head fastener
1/4-20 slot nut

Standoff Assembly;

(For standard steel stud and drywall applications only)
Toggle anchor

1/4-20x4" Phillips head screw

Aluminum Retainer Splice Connections;

Aluminum retainer splice
1/4-20x3/8" button head fastener

INSTALLATION

Install the longest run of the handrail first, use scrap for shorter runs. The handrail requires a minimum of 2 standoffs per unit/run. The minimum distance of a straight run for this handrail is 17" (see Figure 1). The minimum distance from a corner to an end cap for this handrail is 8-1/2" (see Figure 3).

STEP 1. Using the correct plans, layout guides and local code requirements layout and mark the location of the handrail on the wall at the appropriate height above the finished floor. Measure 2-3/4" down from the desired top of the handrail and mark this location at each end of the run (See Figure 2). Snap a chalk line, or use a laser level to mark the height of the standoff fasteners.

STEP 2. Layout the handrail runs, marking the location of each standoff along the chalk or laser line. There must be a standoff located 6" from the start and the end of each run. Standoffs must be located 6" from all outside corners and 10" from all inside corners. The remaining standoffs are to be spaced a maximum of 32" O.C.. Make sure there is an equal distance on both ends of the handrail run from door jambs and windows (see Figures 1, & 3).

STEP 3. Drill 1/2" holes at the marked locations for each standoff, then insert a toggle in each hole (see toggle instructions on page 4). Using the 1/4-20x4" hardware supplied by Nudo attach the standoffs to the wall along the run (see Figure 4).

NOTE: observe all safety precautions when drilling to avoid all utilities and re-bar.

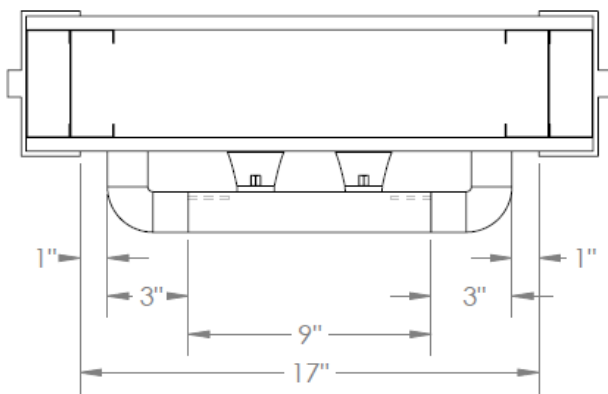


Figure 1

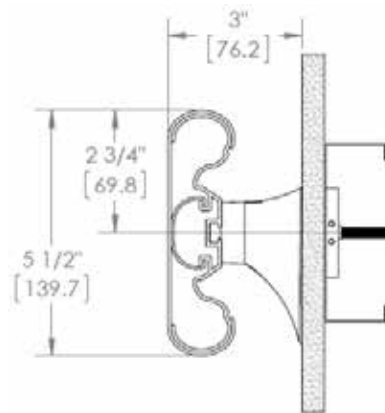


Figure 2

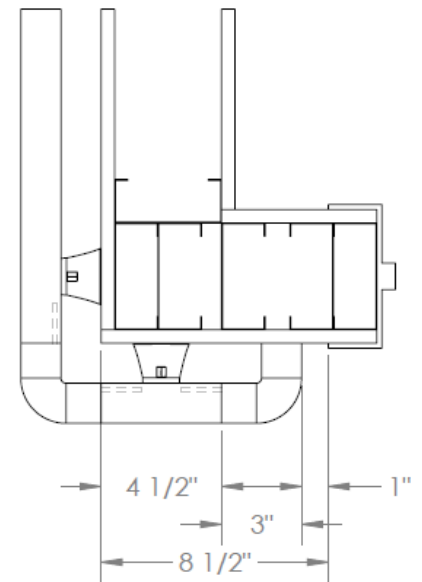


Figure 3

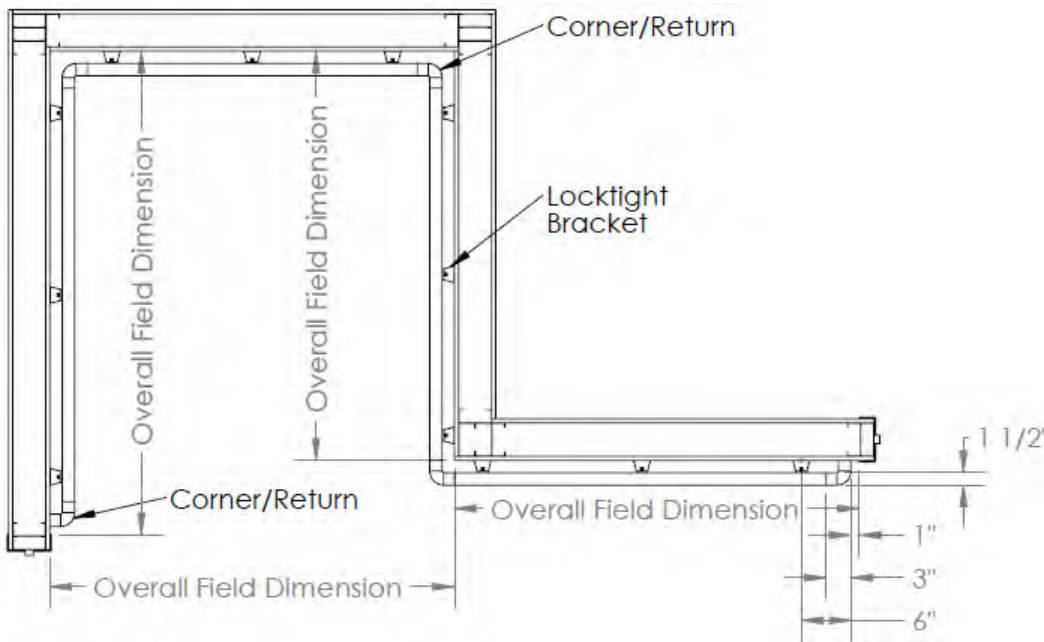


Figure 5

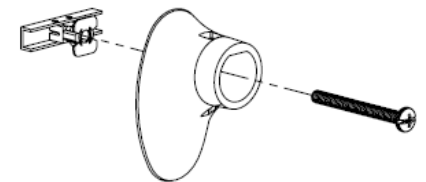


Figure 4

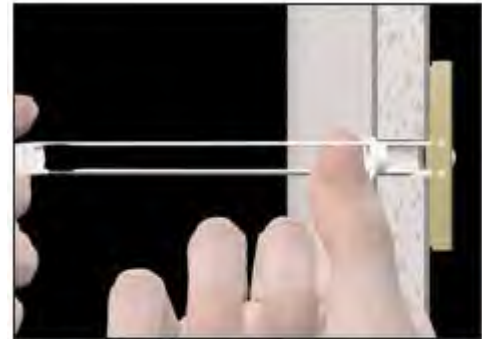
TOGGLE INSTALLATION INSTRUCTIONS & TECHNICAL DATA

STEP 1



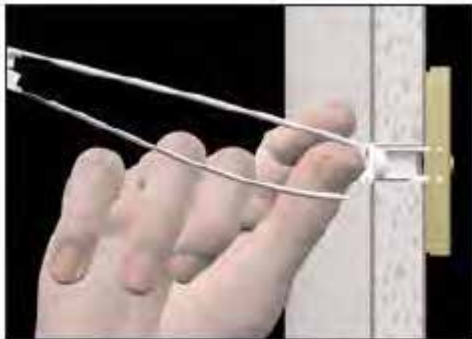
Drill appropriate size hole (1/2"). Hold metal channel flat alongside plastic strips and slide channel through the hole. Minimum clearance behind wall: only 1-7/8".

STEP 2



Hold ends of straps together between thumb and forefinger and pull toward you until channel rests behind the wall. Ratchet cap along the straps with other hand until flange of the cap is flush with wall.

STEP 3



Place thumb between the straps at the wall. Push thumb side to side, snapping off the straps level with the flange of the cap.

STEP 4



Place standoff to the wall over the flange. Using 1/4, 20 tap bolt, Insert tap and tighten until snug against the standoff, then stop.

Ultimate Tensile Pull-out Values (lb)

UNC Thread	Drill dia.	1/2" Drywall	5/8" Drywall	*1/2" with 25 gauge stud	*5/8" with 25 gauge stud	Concrete block	1/2" Steel plate
1/4"-20	1/2"	265	356	425	464	1080	1288 ²

* Failure measured as breakage of drywall portion

² Hardened bolts used

Ultimate Shear (lb)

UNC Thread	Drill dia.	1/2" Drywall	5/8" Drywall
1/4"-20	1/2"	241	324

For maximum shear holding, orient channels vertically to the floor.

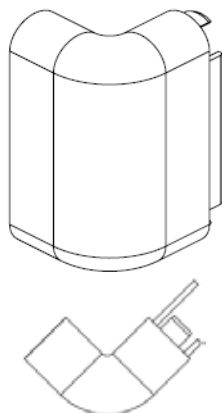
- Use hardened or stainless bolts for maximum weight load.
- Enlargement of specified insertion holes size will reduce anchor effectiveness.
- All toggle anchors meet requirements of Type V anchors in Federal Specification FF-B-588-D (superseded). 1/4-20 x 4" tap bolt/screw (fully threaded) meeting or exceeding ASTM A307 Grade A and SAE J429 Grade 1 requirements.

STEP 4. If returns are not pre-assembled by the factory, select proper amount of corner housings to assemble all left hand returns required. The select the proper amount of left hand adapters. Using the factory supplied screws affix the adapters to the corner Housing (see Page 2, Typical Assembly). Repeat this step for the right hand returns and the corners, using two adapters per corner (see End Cap, Inside Corner, and Outside Corner Diagrams Below).

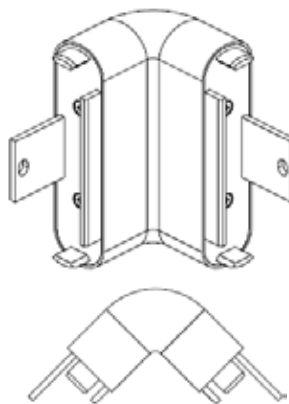
NOTE: The corner adapters are reversible enabling them to be used for an outside as well as an inside corner application.

STEP 5. Select the end caps or outside corners for each section. Place the factory supplied screw through the hole in the tab on the endcap/corner, then loosely attach the factor supplied slot nut to the screw (see Figure 6). Place the retainer on it's side, then slide the end cap/corner into position with the tab to the back of the retainer and the slotted nut in the center channel of the retainer (see Figures 7 & 8). Once the end cap/corner is properly seated in the channel and flush with the end of the retainer, tighten the screw to hold the end cap/corner in place (see Figure 9).

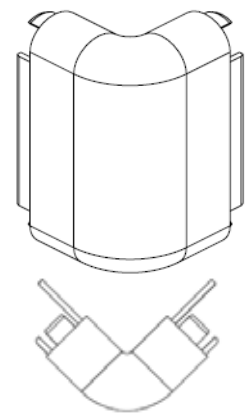
NOTE: The handrail cover can be attached to the aluminum retainer prior to mounting the handrail to the standoffs as long as there are no splices in the run, if you desire to do so go to steps #7 & #8 before step #6.



END CAP



INSIDE CORNER



OUTSIDE CORNER

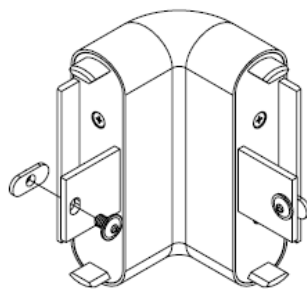


Figure 6

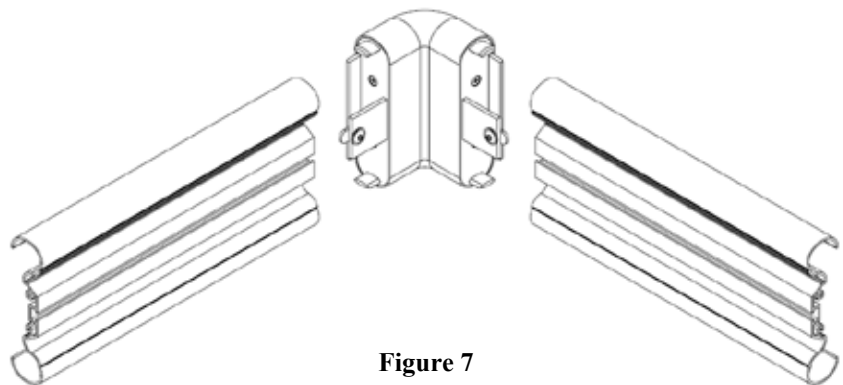


Figure 7

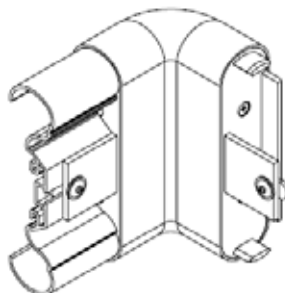


Figure 8

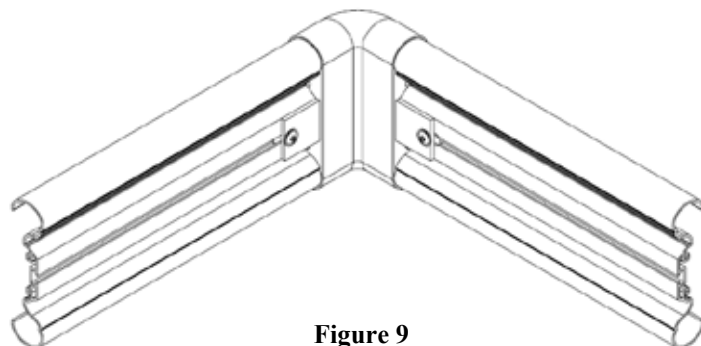


Figure 9

STEP 6. Insert the required amount of locking brackets for the run into the channel on the back of the aluminum retainer with the flat side of the locking bracket facing up (see Figure 10). Align the locking brackets with the standoffs along the run, then lift the handrail assembly into place, pushing the locking brackets into the standoffs (see Figure 11). Insert and push down on the locking pin until it is flush with the top of the standoff to lock the handrail assembly into place (see Figure 12). Should you need to remove the handrail for any reason use a screw driver at the bottom of the standoff to push the clip up unsnapping the mounting bracket from the standoff.

STEP 7. Select a section of the impact bumper; cut to length if required. Note: Be sure to leave a 1" gap at each end of the impact bumper where the handrail corners or ends. Place the impact bumper in the center of the retainer, then snap into place along the center of the retainer (see Figure 14).

STEP 8. Select the appropriate handrail cover, cut to length if required, place the top lip of the cover over the top of the retainer (see Figure 14). Starting at one end, using the palm of the hand, push the cover down over the bottom of the retainer.

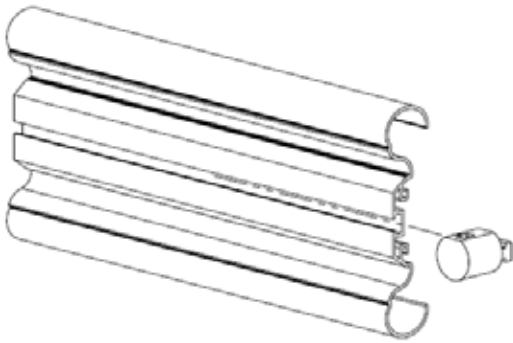


Figure 10

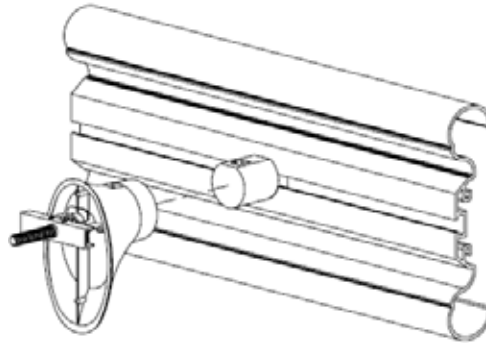


Figure 11

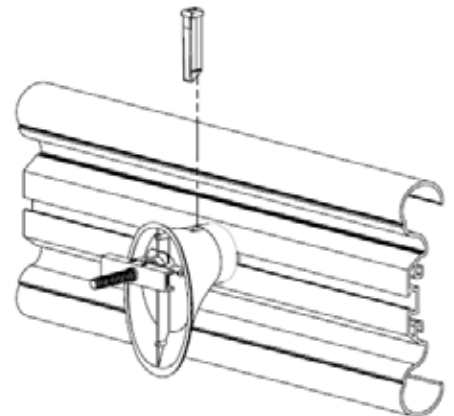


Figure 12

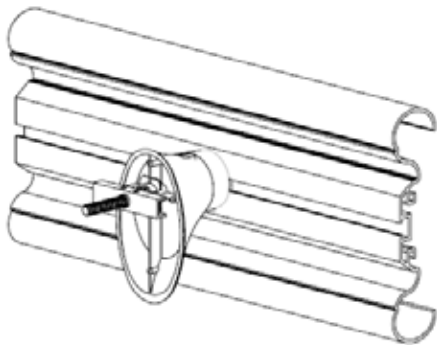


Figure 13

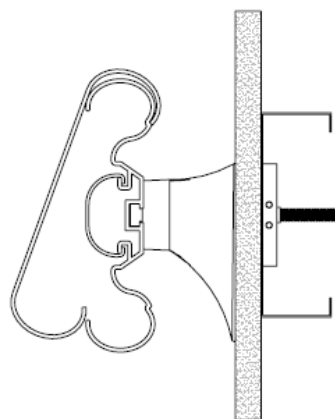


Figure 14

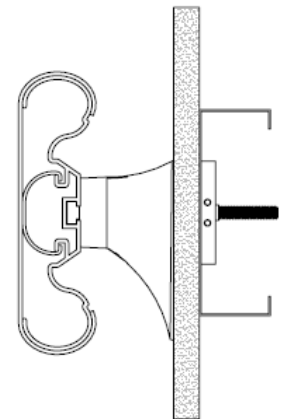


Figure 15

CLEANING INSTRUCTIONS

1. For best results, the use of liquid cleaners such as "409", "Fantastic", "Mr. Clean", etc. are recommended. The use of powder cleansers is not recommended, use of such cleaners can leave residue which is difficult to remove.
2. Do not use chlorinated or aromatic hydrocarbons, esters or ketones to clean Nudo vinyl products. Avoid the use of heavy degreasers, compounds containing surfactants, and abrasive compounds or cleaning devices.