

MILSPEC PRODUCTS, INC.

Installation of MS245 Adjusting Receptacles and 4000 Series C-Spec Fasteners (FAA Approved TSO-C-148)

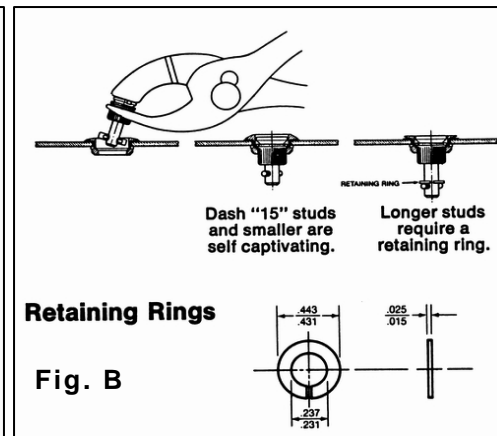
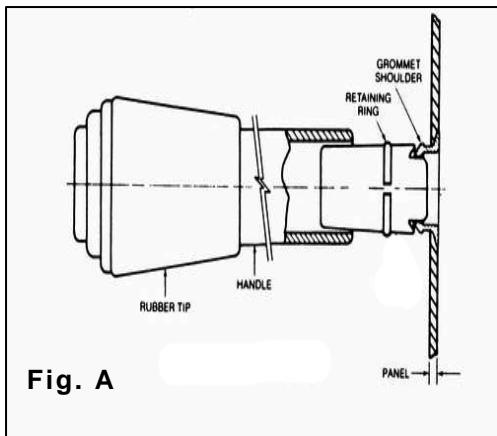
WARRANTY: MilSpec will replace any part that is found to be defective in material or workmanship upon return and inspection for up to one year after the invoice date. This warranty does not cover damage to any other components, labor, personal injury or any other damage or injury. This warranty is expressly in lieu of any other warranty expressed or implied and / or any other liability or obligation on the part of MilSpec. **Quarter turn fasteners are not designed for excessive torque.** If excessive torque is required to lock the stud, there is a problem with the installation. Usually the fastener is too short for the application or the receptacles are improperly installed. Forcing the fastener to lock will only weaken the stud assembly and potentially cause the entire system to fail. **MilSpec does not warranty fasteners with obvious signs of excessive torque. Proper stud installation should allow the fastener to be operated by a screw driver held only with the thumb and two fingers.**

WARNING: Buyer takes full responsibility for the proper use and installation of the parts contained herein and that the installation is in accordance with all relevant FAA or other governmental regulations.

Outside Panel Preparation:

Grommet Installation: Drill a 1/8" pilot hole for the 4000 series grommet at the desired fastener location. Ensure that the center of the hole is at least .625" (5/8") from the edge of the panel to provide enough clearance for the face of the grommet. You can then position the outside panel over the support panel or structure and using the existing pilot hole, drill another 1/8" pilot hole in the support panel or structure. This will insure that the fastener center and receptacle center will be properly aligned with one another. Proceed around the panel repeating this process at all intended fastener locations. Be careful not to move the panel while proceeding from location to location. We recommend using Cleko® type temporary fasteners for this. After you have good pilot holes in both structures, you can then remove the outside panel and enlarge it's pilot hole to .468" (15/32") for the fastener grommet. We recommend using UniBit #1 for this operation to make a perfectly circular hole as regular drill bits can sometimes walk and create an irregular hole.

Next, press the grommet through the hole (it should be a relatively tight fit) and secure it in the panel by installing the grommet retainer on the back side. We recommend retaining ring part number R4G for most applications but, you can use R4T if desired. To install the retainer, use installation tool part number MS-T26. Place the retaining ring on the narrow end of the conical shaped insert and push it toward the wider end. Then, working from the back side (inside) of the outer panel, place the insert tool in the center of the grommet and engage the tube handle as shown in **Fig. A**. As the handle slides over the insert, the ring will be properly seated on the grommet. Verify that the grommet is secured in the panel. Repeat this process at all intended fastener locations.



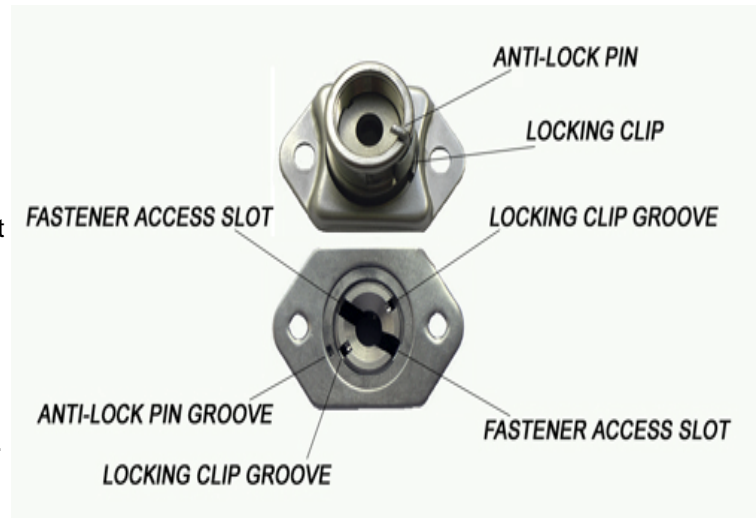
Stud Assembly Installation: Using the C-Spec installation pliers part number 4P3, place the stud assembly in the U shaped recess of the pliers and depress the stud / spring assembly. This will allow the stud to be angled through the grommet as shown in **Fig. B**. Once the stud has been properly installed in the grommet, remove the pliers and verify that the stud assembly is secure in the grommet. Repeat this procedure at all locations. Stud assemblies up to dash 15 in length are self retaining. If using a stud length longer than dash 15 a secondary stud retainer part number 4002-SW is required.

Support Panel Preparation:

For New Panels, Using the 1/8" receptacle center pilot hole already drilled in the support panel or structure, use drill jig part number MS-T16 (wide end) or drill template DT-4 to locate and drill the rivet holes from the existing center hole. The jig / template will insure that the proper spacing is used. Clekos® come in handy when using the template to insure proper orientation. Next, enlarge the center pilot hole to a minimum of 1/2" (.500") but not more than 11/16" (.687"). This is to allow clearance for *reasonable* misalignment. We recommend using drill template DT-4B (large center hole) for this process. Now countersink the two rivet holes at 100° to a diameter of .210". We recommend using CherryMax CR3212 series rivets to secure the MS245 receptacle to the back side of the support panel or structure. However, many installations use solid rivets as well. If solid rivets are preferred please use MS20426AD series rivets. Install the rivets using approved industry standards and methods.

Installation of the Panel and Depth Adjustment of Receptacles: The next step is to mount the panels, engage the fasteners and adjust the receptacles for proper depth. But before we do that, let's take some time to get familiar with the features and components that make up the receptacle assembly.

ADJUSTABLE RECEPTACLES: The main components are a threaded barrel, threaded insert, locking clip and anti-lock pin. The insert is the portion that the fastener stud locks into. It has two straight vertical grooves machined on the outside diameter. These grooves are where the locking clip engages to prevent the insert from rotating after the proper depth has been acquired. For the initial adjustment we have installed an anti-lock pin in a groove on the O.D. of the barrel, underneath the locking clip. This pin keeps the locking clip from engaging until the proper fit is determined. **These pins should be left in for the installation and panel fitting process but, they MUST be removed prior to deployment of the panel (enclosure).** If the pins are not removed and the inserts are not properly locked, the fasteners could potentially unlock while in use. Be sure that the locking clip is properly engaged into one of the locking grooves of the receptacle insert (not the fastener access slots) and that the insert does not rotate more than 5° in either direction using *reasonable* force.



INSTALLING THE PANELS: Now that the fasteners, grommets, and receptacles are installed, position the panel and engage the fasteners into the receptacles. We find the best way to fasten the panel is to engage the fasteners at the corners first and then fasten the rest working from the center out. This helps to align everything and avoid any binding situations. The studs should lock with the head protruding slightly from the grommet, this is normal. If you are having trouble engaging or locking a stud, remove the stud from the panel with the 4P3 pliers and check for center alignment of the fastener and receptacle. Although the MS245 receptacles are floating and should accommodate minor misalignment, they are limited to 1/16" total float. Anything beyond this may require adjustment of the receptacle mounting position. Lock all of the studs that do not appear to have an alignment problem. If any receptacles require center alignment, make note of which direction they need to be moved and plan to make the necessary adjustments.

INITIAL RECEPTACLE ADJUSTMENT: The studs should be locked with the head protruding slightly from the grommet which is normal. To perform the initial depth adjustment of the receptacles, simply turn the studs clockwise just like tightening a screw until the stud head is just flush with the grommet. Proceed around the panel performing this operation at all locations. **Do not go beyond flush as this will over stress the stud assembly.**

Now that all locations have been fitted and any receptacles requiring final alignment adjustments have been noted, the outside panel can be taken back off and the anti-lock pins removed from the receptacles. **To unlock the studs without spinning the receptacle insert, you will need some fancy wrist action and a bit of a feel for it. The way to do this is to push in on the stud head *slightly* and with a quick motion, release pressure while giving the stud a 1/4 turn counter clockwise.** This is not difficult but, may take a few attempts to get it just right.

LOCKING THE INSERT AND SETTING RECEPTACLE DEPTH: Once the studs are unlocked and the outside panel is removed, go to the receptacle and remove the anti-lock pin. Before removing the pin make sure the locking clip is lined up with one of the locking grooves in the insert. Note that there are two locking grooves in the insert 180° apart. This allows adjustments in .015" increments. Typical studs vary in length by .030" so with the MilSpec Adjustable receptacles you can fine tune the fit of your panel in increments equal to 1/2 of a typical stud length. You may need to turn the insert with a flat blade screwdriver a half turn or so until one of the grooves in the insert comes around to the position of the locking clip. **Be sure that the locking clip is engaged**

