

SKYDRATE



TSC INSTALLATION GUIDE

OMNI
DEFENSE TECH

Through Suit Connector



Through Suit Connector (TSC)

When used with a TSC enabled garment, the device can easily connect and disconnect from the suit, without the need to unzip, providing the ultimate in discrete operation.

Environmentally Sealed

With the Through Suit Connector (TSC), the system is fully self-contained within the flight suit.



Connect to TSC

When using a TSC enabled garment, attach the White end of the **TSC Compatible Hose** to the inside (white side) of the TSC port.



Connect TSC to System

Connect the TSC Hose to the external TSC port, and then to the Skydrate Control Unit and Bag for use.



Through Suit Connector

TSC Connector

There are two versions of the TSC connector, one for the MALE system and one for the FEMALE system, denoted by the color of the connector center.



MALE (BLACK)
ESC-35-2 M



FEMALE (TAN)
ESC-35-2 F

Interior Hose

A TSC Compatible hose attaches to the interior of the TSC port, which provides a 360° swivel connection.

RHA-21B-2-12-M MALE



RHA-21B-2-12-F FEMALE



Exterior Hose

The TSC Hose connects to the external TSC port, and then to the Skydrate Control Unit and Bag for use. It features a fail-safe quick disconnect.

RBU-40-2-M MALE



RBU-40-2-F FEMALE



ESC-35-2 Installation Instructions

1. Installation Procedures

- a. Assemble the installation press-vice.
 - i. Insert the vice side into the slot on the bottom of the press, as shown in (Figure 1) and secure with the thumbscrew.



Figure 1. Installation Press-Vice Assembly

- b. Secure the installation press-vice to a table or other flat surface for installation (Figure 2).

2. Preparing the Garment

NOTE

Mark flight suit where the center of the TSC will be placed.

- a. Proper placement of the TSC is critical, marking the location of the installation must be accomplished with the Aircrew strapped into an applicable aircraft (A/C) seat or equivalent. Have aircrew don flight suit and applicable mission Pilot Flight Equipment (PFE)
- b. While seated and strapped into the applicable seat, determine and mark the desired location for the TSC on the flight suit (Figure 3).



**Figure 2.
Installation
Press-Vice
Secured to Table**
Version A (pink)
Version B (blue)

ESC-35-2 Installation Instructions



Figure 3. Marking of the Installation Site

- c. Typical location where TSC will be installed on flight suit (Figure 4).



Figure 4. Installed on Flight Suit in Typical Location

3. Primary Hole Punch Operation

- a. Hold the fabric ring clip beneath the mark on the inside of the garment, with the tongs facing the material. (Figure 5)

ESC-35-2 Installation Instructions

INSIDE



Figure 5.
Fabric Ring Clip Placement



OUTSIDE

Figure 6.
Fabric Ring Holder Placement

NOTE

Fabric ring holder should fit snugly into fabric ring clip. If it does not, select a larger size.

- b. Center fabric ring holder onto mark on outside of garment and press into fabric ring clip.
- c. Ensure all fabric slack is removed before punching hole, but do not stretch fabric (Figure 6).
- d. Place the fabric punch disc blank into the fabric punch base (Figure 7).



Figure 7.
Fabric Punch Base



Figure 8.
Punch Base Placement

- e. Ensuring fabric punch disc doesn't move, place fabric ring holder onto the punch base (Figure 8).

ESC-35-2 Installation Instructions



Figure 9. Fabric Ring Clip, Fabric Ring, and Punch Base Placement

- f. Holding the entire assembly, place the punch base into the recess on the installation press (Figure 9).

WARNING

Utilize caution when handling fabric punch holder due to sharp blade in base. Failure to comply could result in injuries to user.

- g. Hold the punch base in position and place the punch holder through the hole in the fabric ring clip (Figure 10)



Figure 10. Position and Place the Fabric Holder

CAUTION

Failure to raise and rotate fabric punch holder could result in fabric damage.

- h. While holding the fabric punch holder, rotate the press lever and apply pressure to fabric punch holder through the fabric, at least three times, lifting and rotating fabric punch holder between each press.



Figure 11.
Applying Pressure



Figure 12.
Removal of Fabric Punch Holder

- i. Remove the fabric punch holder (Figure 12).
- j. Verify cut went completely through fabric.

NOTE

If fabric is not cut completely through after three presses, replace fabric cutter blade and repeat punch procedure.

- k. Remove entire assembly from the recess on the installation press-vice.
- l. Remove fabric punch base from the assembly.
- m. Discard fabric punch disc.

4. Fitting the TSC.

- a. Visually check the TSC connector and TSC lock to ensure that the three RED sealing O-Rings (pictured below) are installed and in place. **The Female TSC connector has 2 additional BLACK O-Rings at the top of the connector.** (Figure 13).



Figure 13. O-Ring Inspection

- b. Place the TSC connector into the TSC holder base. Turn the connector until it drops into place, flush with the top of this base with O-Rings showing (Figure 14).



Figure 14. TSC Connector Into the TSC Holder Base



Figure 15. TSC Holder Base Into the Recess on the Installation Press Stand

- c. Place the TSC holder base into the recess on the installation press stand. Place the fabric ring holder and fabric ring clip onto the TSC holder base (Figure 15).

NOTE

A slight pull on the fabric outside the fabric clip may be necessary to ensure the O-Ring is visible around the TSC



Figure 16. O-Ring is Exposed and Above the Fabric

- d. Ensure that the sealing O-Ring is exposed and above the fabric. Gently press the fabric down beneath the O-Ring with the Torx Screwdriver (Figure 16).



Figure 17. TSC Lock on the Lock Holder

- e. Place the TSC lock onto the lock holder. It should fit snugly in place with O-Ring showing (Figure 17).
- f. Place the lock holder and TSC lock through the hole on the fabric ring clip and push it down lightly.
- g. Rotate the lock holder until the lock falls into place.

CAUTION

Depending on the fabric being used, more force may be needed to ensure that the TSC lock is pushed securely in place. Failure to comply may result in failure to properly seal the two TSC halves.

- h. While holding the lock holder, rotate the press lever and apply pressure for a minimum of three presses, until the TSC lock is in place and on the TSC connector (Figure 18)



Figure 18. Seating Holder

NOTE

To ensure that the lock is in place, it may take five or six very firm presses, for about 5 seconds each.

- i. Remove the lock holder by pressing down on fabric ring clip and tilting TSC lock holder away to one side so the lock ring does not lift off with it. Ensure TSC lock doesn't move. If it does, *repeat steps f through step i.*(Figure 19)



Figure 19. Removing Lock Holder

- j. Remove entire assembly from installation press-vice. By slightly tilting to one side, gently lift entire assembly, ensuring that TSC does not separate or come loose. If it does, *repeat steps f through step i.*
- k. Use the fabric punch to make screw holes in the fabric while holding lock ring in place. Push the fabric punch through the fabric until the fabric punch bottoms out. Twist fabric punch slightly to remove (Figure 20). If TSC lock moves, *repeat steps f through step j.*



Figure 20. Making Holes with Fabric Punch

CAUTION

To prevent damage to the screws, the tip of the screwdriver **must** be fully seated in screw head prior to turning either direction. Failure to comply may result in damage to screw head.

- I. Install the four Torx Screws

NOTE

If fabric shows signs of pulling or bunching, remove screw and start again.

- m. Turn screws counterclockwise while pressing down to get the screw through the fabric, making at least two full rotations.
- n. Then tighten the screw normally. Work in a crisscross pattern, screwing in the opposite screws until snug (figure 21).
- o. Torque screws to 75 inch-ounces.



Figure 21. Re-Attach Lock Holder

- p. Place the assembly back into the press and re-attach the lock holder. While holding lock holder press firmly down on the lever several times to ensure the tightest seal possible.
- q. Remove the lock holder and torque the screws a second time (Figure 21).
- r. Detach and remove the fabric ring clip, and fabric ring.

5. Inspecting TSC Installation

CAUTION

Inspect both sides of the TSC to ensure that it is securely in place. Failure to comply may result in leakage.

- a. Inspect both sides of the TSC to ensure that it is securely in place. Ensure that there is NO GAP between the connector and the fabric (FIGURE 22).
- b. If there is a gap, place the connector back into the press. Apply additional pressure with additional presses until the gap is gone. Torque screws afterwards.

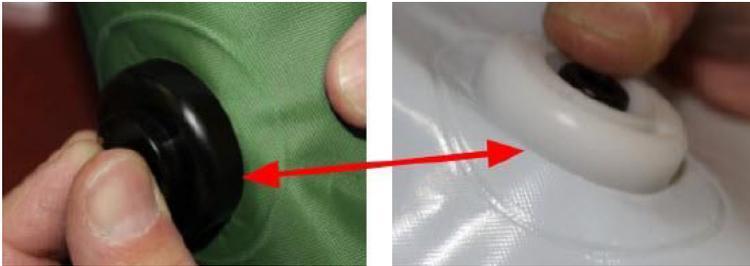


Figure 22. Check for Gap

NOTE

Some fabrics are stiffer than others and the additional force is required to ensure that the TSC seals properly.

- c. Suit with the TSC installed properly (Figure 23)



Figure 23. Suit with TSC Installed

6. Testing

- a. Connect the internal sensor hose and cup or pad (Figure 24).



Figure 24. Internal Sensor Hose and Cup/Pad

- b. Connect external hose and Skydrate (Figure 25).



Figure 24. Internal Sensor Hose and Cup/Pad

- c. To test, pour salted water (1/2 teaspoon salt in 12 ounces water) into cup/pad. System pump should activate automatically and pump water into the Bag.
- d. End of test.

7. Remove and Replace Fabric Cutter Blade

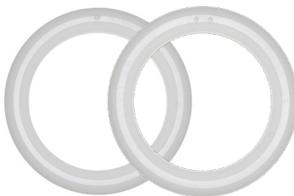
NOTE

Utilize caution when replacing fabric cutter blades due to sharp blade in base. Failure to comply could result in injuries to user.

- a. Remove screw and set aside
- b. Remove white plastic spacer and set aside.
- c. Remove cutter blade and discard.
- d. Insert new cutter blade.
- e. Insert white plastic spacer.
- f. Insert screw and tighten until snug.

8. TSC Installation Kit Components (Figure 26)

As of October 1, 2019, Press version B (TSCK-1B) is supplied with the installation kit, replacing version A (TSCK-1A).





**TSC LOCK HOLDER
(TSCK-8)**



**FABRIC PUNCH HOLDER
(TSCK-6)**



**FABRIC CUTTER BLADES
(TSCK-15) 2 SPARE**



**FABRIC HOLE BLADES
(TSCK-21B) 2 EACH**



**FABRIC HOLE PUNCH
HANDLE (TSCK-21A)**



**T6 TORX DRIVER (TSCK-10B)
WITH HANDLE (TSCK-11B)**

9. TSC Connector Kit Components (Figure 27)



**FEMALE
TSC CONNECTOR (ESC-35-2) (M/F)**



**MALE
TSC CONNECTOR (ESC-35-2) (M/F)**



TSC LOCK (ESC-35-2)



**FABRIC PUNCH DISK BLANK
(TSCK-5)**



**TORX SCREW (4 EACH)
(CCU-20-3-5S)**

To re-order supplies please contact:

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