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INDUSTRIES
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# Essex Crewmember Protective Breathing Equipment (PBE)

# User Reference and Procedures Manual

for

FAA TSO-C116 & TSO-C99 Approved
United Kingdom - Civil Aviation Authority (CAA) Approved
European Aviation Safety Agency (EASA) Approved
Civil Aviation Authority of China (CAAC) Approved
Brazilian Civil Aviation Authority (ANAC) Approved

**Crewmember PBE Assemblies**

Part No: DP3113(A)
Model No's: MR-10022NAF & MR-10021N

Document No: PRM-05, Revision: 1, Dated: 4/23/2015

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| Revision Record Sheet | | |
|---|---|---|
| Rev # | Date | Description of Revision |
| -- | 12/01/11 | Original Issue – Manual was tailored to only include Model #'s MR-10021N and MR-10022NAF. |
| 1 | 4/23/15 | Updated the information in "5. The Essex Crewmember PBE Training Unit." – eliminated fake Scrubbers; clarified method of doffing of trainer; and added expected usage information. |
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**FAA TSO-C116, TSO C-99, CAA, EASA, CAAC, & ANAC APPROVED PBE ASSEMBLIES**

| Model Number | Description |
|---|---|
| MR-10022NAF | Crewmember PBE with Concealed Mounting Holes and Viewing Window for US Air Force |
| MR-10021N | Crewmember PBE – Training Unit |

Note: Part Number DP3113(A) is the Essex Crewmember PBE without a barrier pouch or any type of stowage bracket. The Model Number, MR-10022NAF, designates the type of bracket configuration that Part Number DP3113(A) is assembled into. The Model Number, MR-10021N does not require a bracket configuration.

## 1. DESCRIPTION AND OPERATION

A. General Description of Equipment

(1) Purpose of the Equipment

The Essex PB&R Corp. (Essex) Crewmember PBE (**Ref. Figure 1 on page 6**) is a self-contained, portable, personal breathing device designed to safeguard the wearer from the effects of smoke, carbon dioxide, harmful gases, and oxygen deficiency while managing in-flight fire, smoke or fume emergencies.

The equipment improves the wearer's visibility in smoke-filled compartments, protects the head and face from melting or dripping plastics, and shields the head against brief exposure to heat and flame.

The primary functional component in the Essex Crewmember PBE is a portable hood that contains both a breathable oxygen supply and lithium hydroxide (LiOH) scrubber panels that absorb exhaled carbon dioxide.

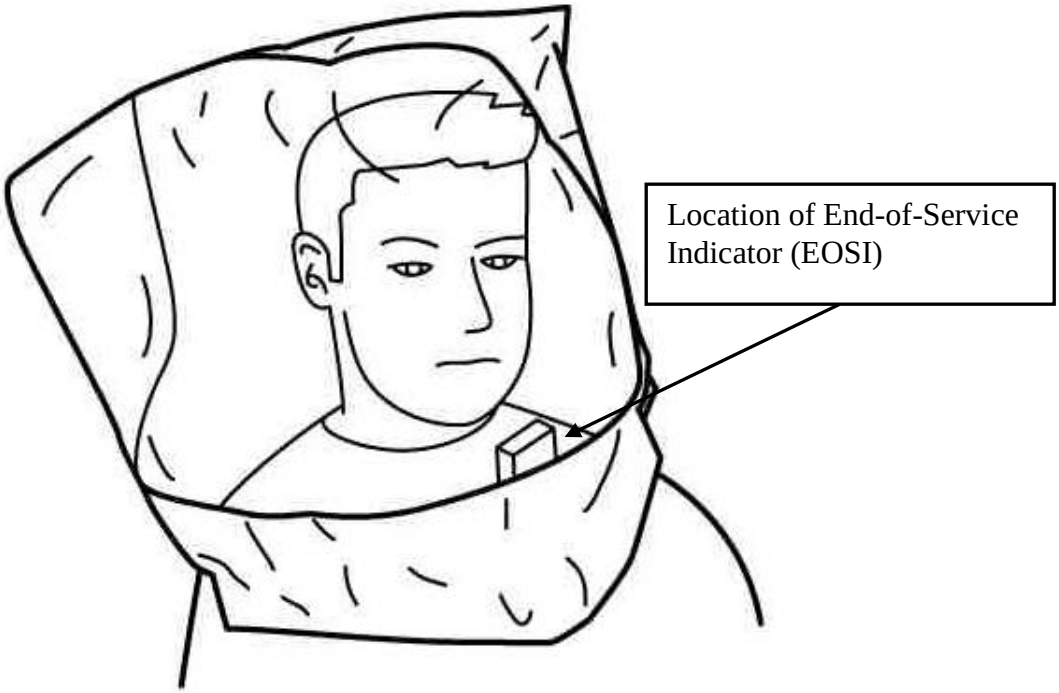
The hood has a self-fitting neck opening that seals out contaminants, retains the oxygen and keeps the hood inflated during use. The entire unit is hermetically sealed at Essex PB&R Corp. to protect the LiOH scrubber panels from outside air.

(2) Hood Shell Construction

The Essex Crewmember PBE hood is fabricated from a durable, tear-resistant combination of polyimide and PFA films. The hood's inner surface has an anti-fog coating to improve visibility.

(3) Oxygen System

The Essex Crewmember PBE has two oxygen cylinders. Together they hold a minimum of 36 liters of Aviator Grade oxygen. These cylinders meet SAE Standard AS 8010 for breathing-oxygen purity, and have rupture protection in case of over pressurization.




Overall View of Essex Crewmember PBE (As Worn)

Figure 1

(4) Service/End-of-Service Indicator

The Essex Crewmember PBE features a battery-powered green and red light Service/End-of-Service Indicator. Mounted slightly below eye level on the left inner side of the hood, this indicator functions as a secondary indicator for monitoring oxygen activation, reassuring the wearer that the equipment is functioning, and signaling when the equipment's service life is ended. (**Ref. Figure 1 above**).

Note: The primary indicator for oxygen activation and proper functioning of the unit is the gradual inflation of the Hood, which takes from 2-3 minutes to fully inflate.

(5) Packaging and Stowage Container

The Essex Crewmember PBE alone weighs 3.2 lbs (1.45 kg). It is folded and packaged in a moisture resistant pouch, and stowed in a protective metal container. A packaged Crewmember PBE is normally installed within 3 ft (.9 m) of each required on-board fire extinguisher. Each airline should receive regulatory approval for installation locations.

(6) Compliance

The Essex Crewmember PBE complies with the requirements of FAA Action Notice A8150.2 and is approved according to FAA TSO-C116 and TSO-C99. The Essex Crewmember PBE is also approved: under BCAR B4-8, United Kingdom – Civil Aviation Authority (CAA) requirements, thereby we are also approved by the European Aviation Safety Agency (EASA); by the Civil Aviation Authority of China (CAAC); and by the Brazilian Civil Aviation Authority (ANAC).

(7) Useful Service Life (Warranty Period)

The Essex Crewmember PBE has a 10-year 6-month, warranted, useful service life, beginning from the date of manufacture.

B. Operating Features

(1) Tamper-Evident Seals

To ensure that the Essex Crewmember PBE has not been tampered with, units have tamper-evident seals.

For internal-mounted stowage case, MR-10022NAF the tamper-evident seals are the tamper-evident labels (Type C). (**Ref. Figure 2 on page 10**)

(2) Pouch Access

The sealed barrier pouch containing the Essex Crewmember PBE is easily accessed and removed from its stowage container. A force of approximately 18-28 pounds will be required to lift the lid & break the tamper-evident seals.

(3) Breathing System

Once the pouch is removed from its container and opened, oxygen flow is initiated by snapping the two cylinders apart, which in turn activates the flashing green light on the Service/End-of-Service Indicator. One bottle releases oxygen rapidly, whereas

the second bottle discharges oxygen slowly. An audible hissing sound and inflation of the unit within (2) minutes is the primary indicator the PBE is operating properly (in loud ambient noise level conditions, this audible hissing sound may not be able to be detected).

Once donned, the Essex Crewmember PBE will protect the wearer for up to 15 minutes. Although both bottles will completely discharge in 8 to 10 minutes, enough oxygen will remain for the full, specified 15 minutes of respiratory protection. When the unit deflates to the point where it touches the wearer's head and face, or when the red light on the Service/End-of-Service Indicator flashes, the unit's useful life has ended and must be removed.

The Essex Crewmember PBE operates at a positive pressure. The neck seal acts as a relief valve to prevent excessive pressure from building up inside the hood.

(4) Time Required to Put On and Take Off Hood

A trained user can access and don the hood in approximately 15 seconds. It can be removed in less than 5 seconds.

(5) Maneuverability During Use

The Essex Crewmember PBE does not restrict or interfere with normal body movements. Even when fully inflated, it is compact enough that the wearer can pass through openings as small as 18 in x 18 in (460 mm x 460 mm).

(6) Carbon Dioxide Control

Special fabric panels inside the hood control carbon dioxide buildup. These panels contain a dustless lithium hydroxide absorbent sealed inside a double walled membrane, which keeps carbon dioxide concentrations at safe levels during the hood's 15-minute service period.

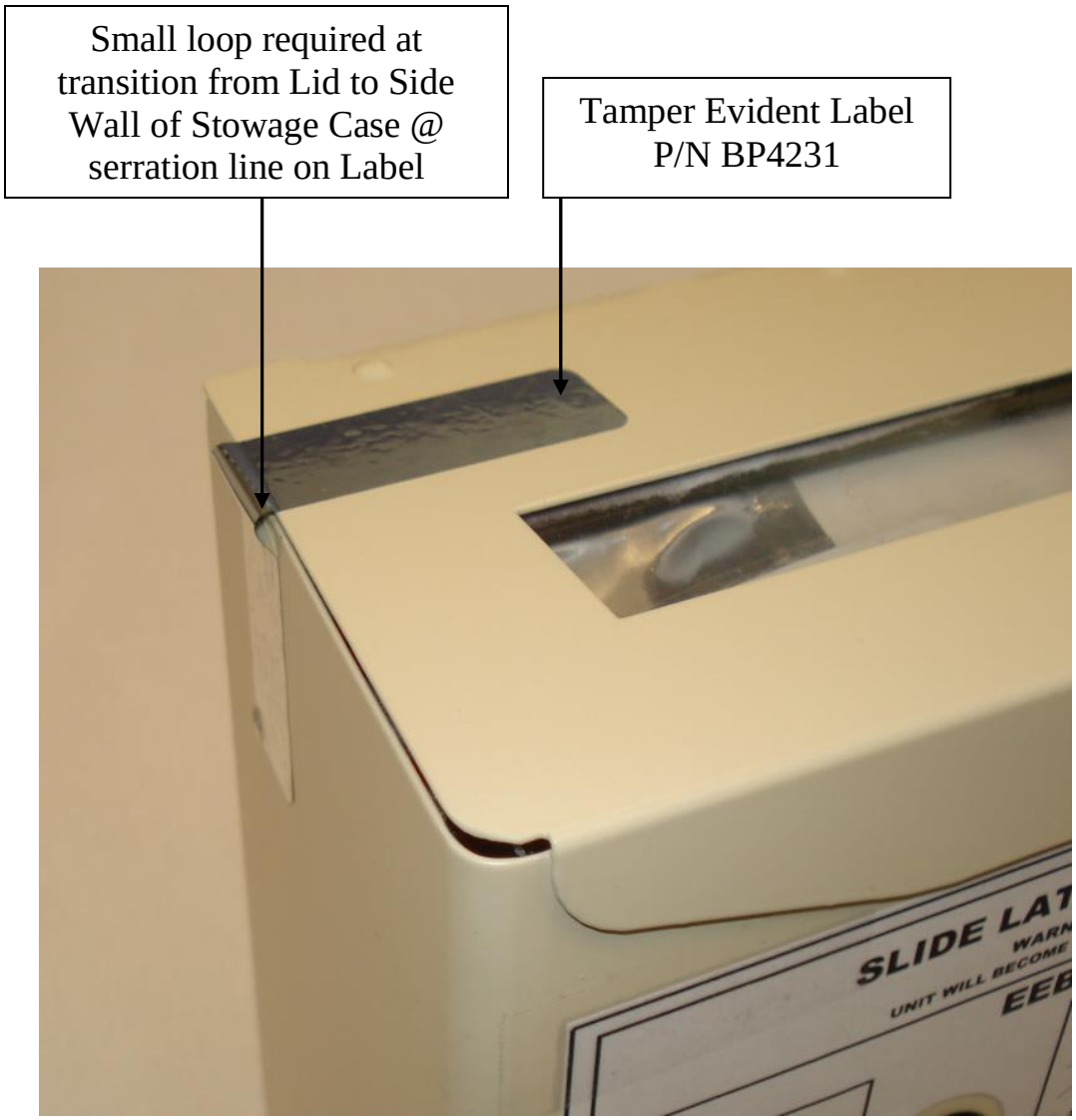
(7) Interpersonal Communications

Persons wearing the Essex Crewmember PBE can communicate by unaided voice with other people wearing hoods, at a distance of at least 13.1 ft (4 m) away.

When using an interphone, megaphone or microphone, it may be necessary to pull the skirt of the hood down so the scrubber is below mouth level. Press the phone unit firmly against the hood film in front of the mouth as shown in **Figure 1A on page 9**, minimizing the gap between the mouth and device.

Megaphone Operation Illustration

Figure 1A




Tamper-Evident Seal

Figure 2

C. Operating Steps

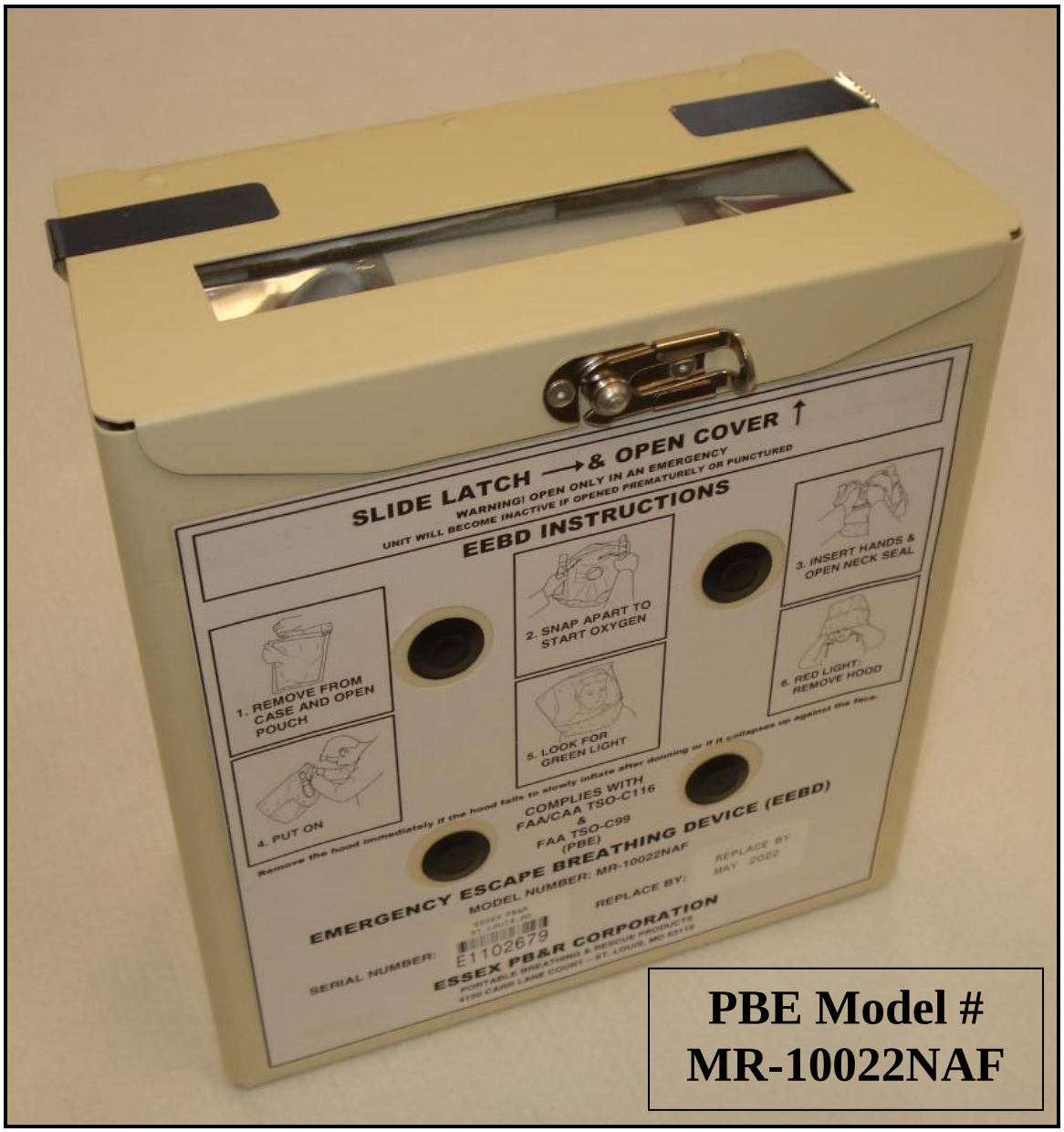
(1) General Sequence of Steps

The normal operating sequence is: access the PBE, open the equipment pouch, activate the system, don the hood, wear it as needed, then remove and dispose of it after use.

(2) Accessing the Essex Crewmember PBE Equipment Pouch

Internal-Mounted Stowage Case (MR-10022NAF) (**Ref. Figure 3 on page 12**)

Slide the lid latch/clasp and pull the box lid open sharply. This will break the tamper-evident seals on the container. Approximately 18 to 28 pounds of force will be required to lift the lid and break the tamper-evident seals. Grasp the yellow nylon strap and pull unit from the container.




| Weight | Size | Height | Width | Depth |
|---|---|---|---|---|
| 5.0 lbs | Inches | 9 3/8 | 8 7/16 | 4 11/16 |
| 2.3 kg | cm | 23.8 | 21.4 | 11.9 |

Figure 3

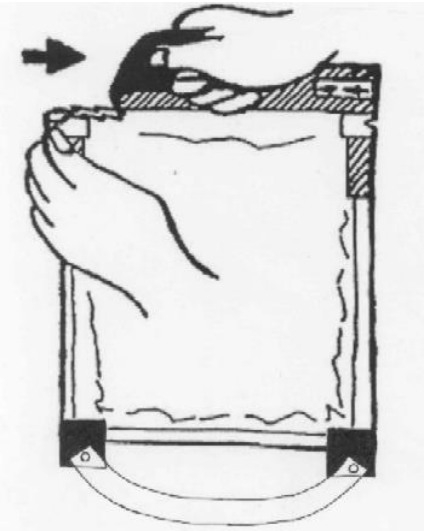
(3) Open the Sealed Pouch (**Ref. Figure 4 below**)

(a) The Tear Open Pouch with the Yellow Nylon Pull Strap is recognizable by the bright red tear strip at the top of the pouch and the yellow pull strap at the bottom of the pouch. To open, grasp the pouch in one hand at either of the small red grip tabs located on each side of the pouch. With the other hand grasp the red tear strip and tear across the pouch in the direction of the arrows. This pouch may be opened from either direction.

NOTE: HOLD THE POUCH TIGHTLY BETWEEN THE KNEES WHILE OPENING IT TO PREVENT THE HOOD FROM FALLING TO THE FLOOR.

(b) Remove the hood from the pouch, then discard the pouch.

**CAUTION: BEFORE ACTIVATING THE OXYGEN, REMOVE OBJECTS FROM AROUND THE HEAD (SUCH AS HAIR COMBS, LONG EARINGS OR JEWELRY) TO PREVENT THEM FROM PUNCTURING THE HOOD OR DAMAGING THE NECK SEAL.**



Tearing Open Barrier Pouch (w/ Nylon Pull Strap)

Opening the Sealed Equipment Pouch to Remove the Essex PBE

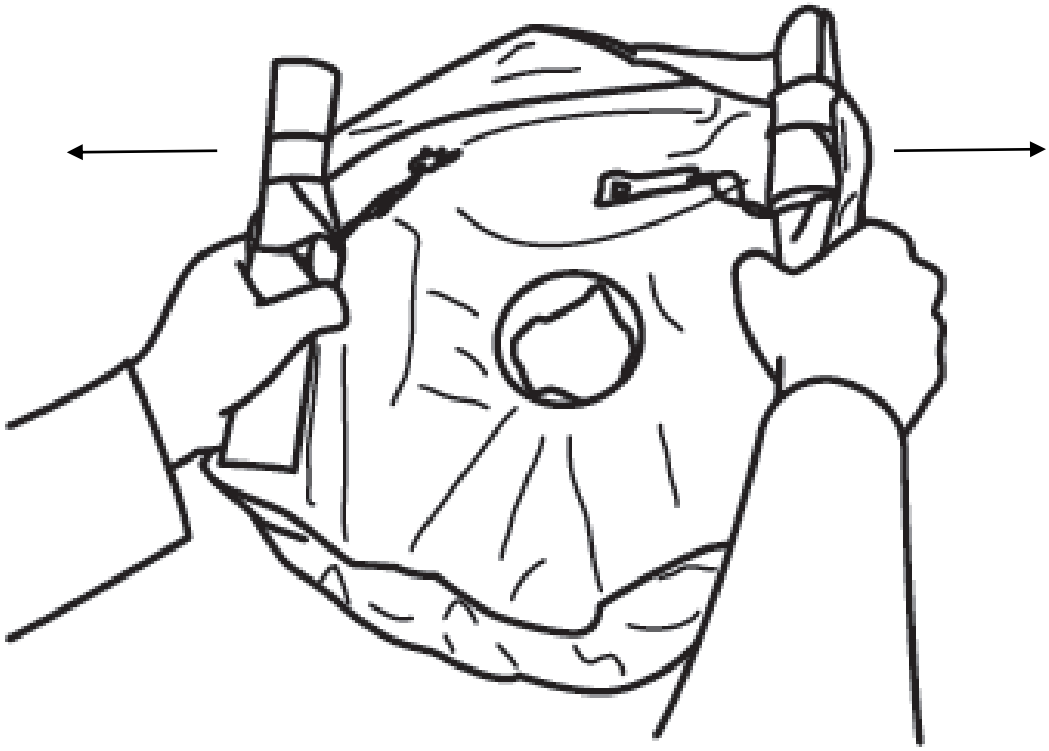
Figure 4

(4) Activate the Oxygen Supply (**Ref. Figure 5 below**)

(a) Before activating the oxygen supply, be sure to position the front of the hood correctly. There are two ways to be sure of this.

(i) If visibility permits, locate the amber-colored, transparent, non-metalized area of the hood. This is the front of the hood. It should not be visible during the activation and donning. The user should see only the metalized area.

(ii) While grasping the oxygen cylinders (one in each hand), make sure that the thumbs are pointing in the same direction as the oxygen valves. (These valves are thinner than the cylinders and will be covered with felt.)



Activating the Essex PBE Oxygen Supply Preparatory to Donning It

Figure 5

Unfold the hood far enough to reveal the oxygen cylinders. Grasp each securely, one in each hand, with thumbs pointing toward the valves (the thin end of each bottle).

Sharply snap the oxygen cylinders away from each other. This sharp action pulls on the two cords that trigger the oxygen flow and activates the green light on the Service/End-of-Service Indicator.

NOTE: DO NOT PULL THE OXYGEN CYLINDERS APART SLOWLY. DOING SO WILL INCREASE THE FORCE NECESSARY TO ACTIVATE THE EQUIPMENT.

**WARNING: TO AVOID LOSING OXYGEN ONCE THE SYSTEM IS ACTIVATED, AND TO MINIMIZE THE AMOUNT OF TOXINS THAT MAY ENTER THE HOOD, DON THE HOOD PROMPTLY AFTER ACTIVATION.**

(5) Don the Activated Hood (**Ref. Figure 6 on page 16**)

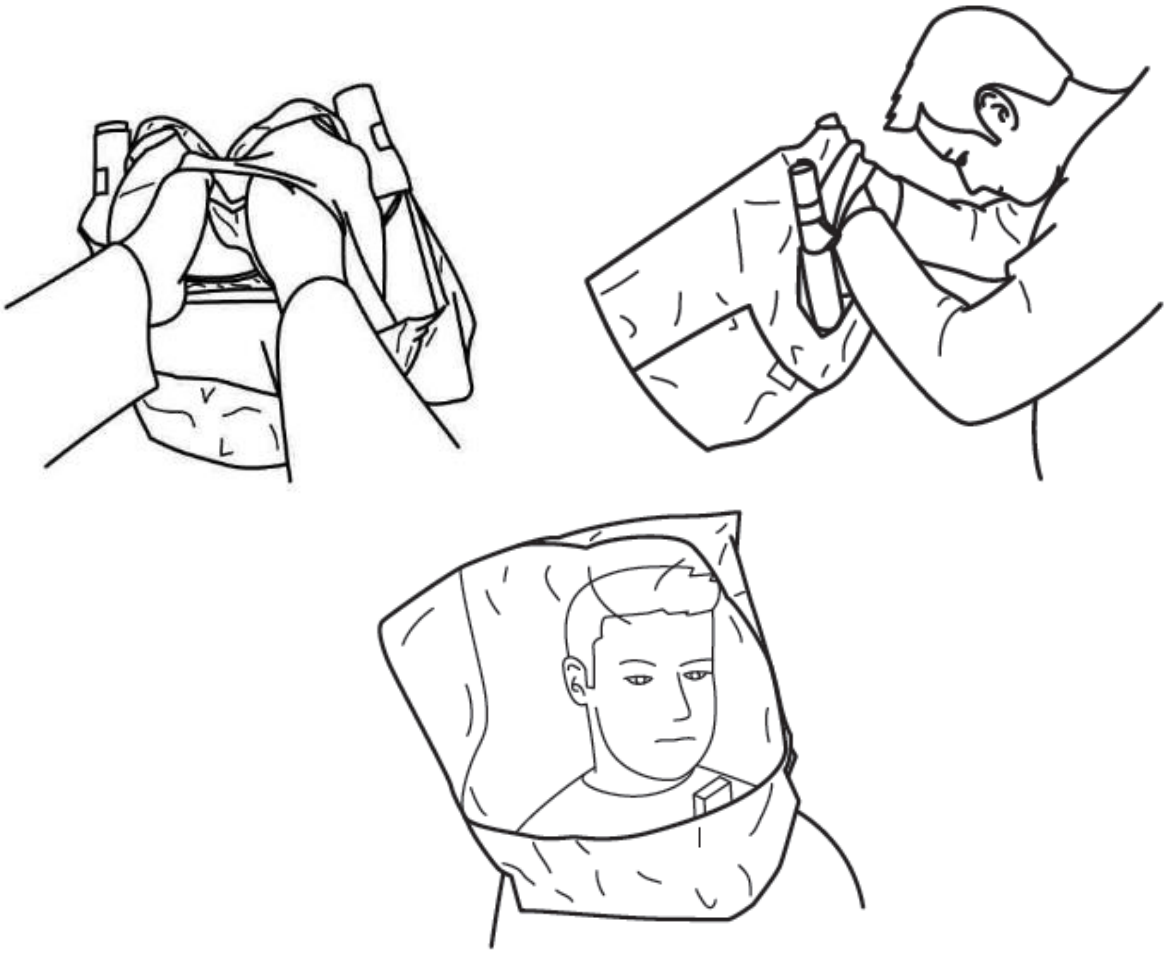
(a) The sharp snapping action required to activate the equipment will reveal the self-fitting elastic neck seal opening.

(b) Hold the equipment at about waist level. Place both hands inside the neck seal opening, with palms facing each other. Stretch the neck seal open by spreading the hands apart.

(c) Lift up the opened hood with both hands, and then lower it down over the head until it fits securely around the neck.

NOTE: EYEGLASS WEARERS SHOULD FIRST POSITION THE NECK SEAL AGAINST THE BACK OF THE HEAD, THEN PULL THE HOOD FORWARD AND DOWN OVER THE EYEGLASSES.

NOTE: MAKE SURE THAT SHIRT COLLARS OR SCARVES DO NOT INTERFERE WITH THE NECKSEAL.



Donning the Activated Essex PBE

Figure 6

**WARNING: AFTER DONNING THE HOOD, DO NOT OPEN THE NECK SEAL EXCEPT TO QUICKLY TUCK IN HAIR, OR TO ADJUST THE HOOD'S POSITION. HAVE ANOTHER PERSON HELP IF NEEDED.**

(d) The equipment is donned correctly if the oxygen cylinders are positioned over the shoulders under each ear and the transparent amber-colored area is facing front.

If the hood is accidentally donned backwards, do not remove it. Instead, rotate the hood until it is properly positioned.

**WARNING: IF THE HOOD DOES NOT INFLATE WITHIN 2 TO 3 MINUTES, OR COLLAPSES AGAINST THE USER'S FACE, REMOVE THE EQUIPMENT AND DISCARD IT IMMEDIATELY:**

**WARNING: DO NOT PASS ALONG AN ACTIVATED HOOD TO ANOTHER PERSON ONCE IT IS DONNED. THIS WILL CAUSE OXYGEN TO ESCAPE AND CAN SUBSTANTIALLY REDUCE PERFORMANCE.**

(6) Wearing the Hood

Full hood inflation takes from 2 to 3 minutes but the equipment is ready for use immediately. During the first few minutes the oxygen makes a noticeably loud, hissing sound that gradually diminishes (in loud ambient noise level conditions, this audible hissing sound may not be able to be detected). The oxygen stops flowing after 8 to 10 minutes, but enough remains in the hood for a full 15 minutes of usage.

**WARNING: IF THE HOOD COLLAPSES AROUND THE FACE AT ANYTIME, REMOVE IT IMMEDIATELY AND OBTAIN A NEW ONE.**

**WARNING: DO NOT APPROACH ANY CLOSER TO A FIRE OR FLAMES THAN THE NORMAL RANGE OF AN APPROVED FIRE EXTINGUISHER, SINCE THE USER WILL ORDINARILY NOT BE WEARING FIRE-RESISTANT CLOTHING.**

(a) Observe the flashing green Service/End-of-Service Indicator light inside the hood, located to the left and just below eye level. When the red light flashes with the green light, or when the hood collapses, move immediately to a safe area and remove the unit.

(b) Note that warming and condensation inside the hood may occur. If this interferes with vision, press the hood against the face to wipe away condensation.

(c) Some users may experience mild ear popping as the air pressure inside the hood gradually increases due to the oxygen flow.

(d) Interphone, megaphone and microphone communication are possible while the hood is still inflating and during its operation. Press the phone device directly against the hood for best operation. Or, place the phone device up against the Adam's apple.

**WARNING: DO NOT REMOVE THE HOOD WHILE NEAR SPARKS OR OPEN FLAME. SOME RESIDUAL OXYGEN MAY REMAIN IN BOTH THE HOOD AND HAIR.**

(7) Remove and Discard the Hood

Remove the PBE if the hood collapses over the face, or as soon as the red light in the Service/End-of-Service indicator comes on, or immediately after the emergency is under control, whichever comes first.

(a) Leave the area of the emergency before attempting to remove the hood.

(b) To remove the hood, insert both hands under the neck seal, beneath the chin. Lift the hood up and out to clear the face.

NOTE: EYEGLASS WEARERS SHOULD FIRST INSERT BOTH HANDS UNDER THE NECK SEAL, THEN PULL THE HOOD FORWARD AND OUTWARD, LIFTING IT UP OVER THE HEAD TO AVOID DISLODGING THE EYEGLASSES.

(8) Dispose of Equipment Properly

**WARNING: DO NOT CUT INTO THE WHITE PANELS AROUND THE COLLAR OR UP THE BACK OF THE HOOD. THIS MAY EXPOSE LITHIUM HYDROXIDE AND LITHIUM CARBONATE, WHICH CAN IRRITATE THE SKIN AND BREATHING PASSAGES.**

Follow these steps in properly disposing of spent equipment.

(a) Cut the neck seal into four quadrants.

(b) Cut a hole in the amber-colored transparent film area at least 5 inches across.

(c) If the oxygen system has not yet been activated, do so before disposing of the equipment.

(i) Handle the oxygen disposal in an area where there is no potential danger from sparks or other fire hazards.

(ii) After equipment has been activated, leave it alone for at least one hour, so that all residual oxygen will dissipate.

(d) Dispose of the hood in compliance with federal, state and local EPA regulations. Contact the appropriate agency for proper disposal procedures. The white scrubber panels contain about 200 grams of lithium hydroxide and/or lithium carbonate.

**INSPECTION AND FAULT ISOLATION**

A. General

(1) Inspection and inspection frequency of PBE's in stowage containers should be in accordance with your governing regulatory authority and your airline operating procedure. The stowage containers will be inspected by one or more of the following indicators: replace by date label, tamper-evident seals, and humidity indicators. Please follow the inspection method that corresponds with your aircraft's PBE stowage container.

(2) For all models, the first step is to inspect the date on the replace by date label. If the replace by date has not been exceeded proceed to the next inspection step. If the replace by date has been exceeded, the unit must be immediately replaced.

B. Methods of Inspection after verification that the unit has not exceeded the replace by date. Refer to Figures 19 and 20 on pages 39 and 40, respectively, for Essex's recommended inspection procedures.

(1) **Tamper-Evident Seals:** Tamper-evident seals are the primary and most recommended means of determining serviceability for PBE's. There are currently three different types of tamper-evident seals used on PBE's, depending on which type of stowage container that the PBE's are placed in. **See Figure 2, Page 11** of this manual for an illustration of the different types of tamper-evident seals.

(2) **Humidity Indicator:** Humidity indicators represent a second level of PBE inspection, if so required. The purpose of the humidity indicator is to show that moisture has gotten inside of the barrier pouch, and may come in contact with the lithium hydroxide scrubbers inside of the hood. Please see Figure 17 below that illustrates accept/reject criteria if you are required to use this method of inspection.

Blue Indicator: ACCEPT

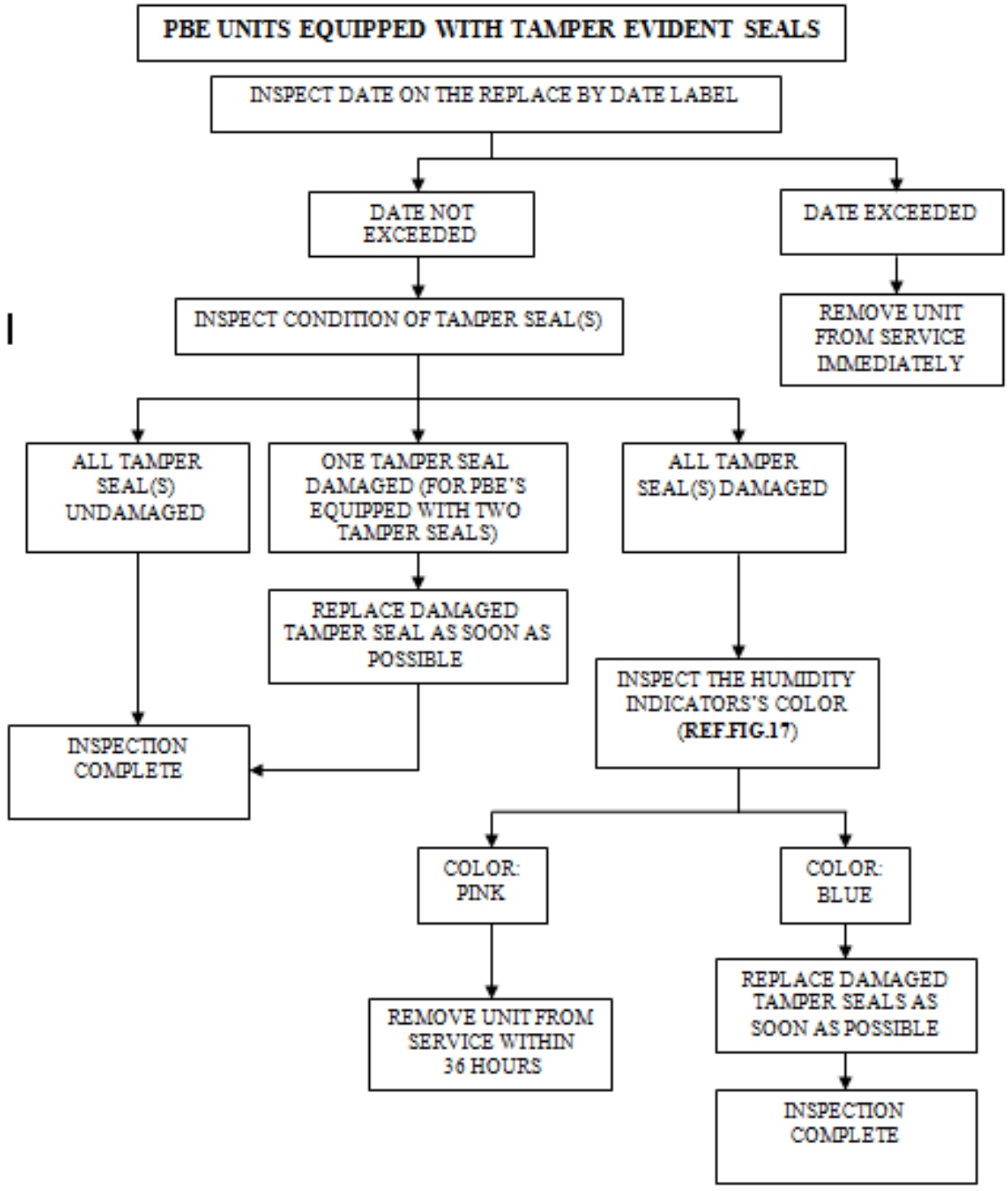
Pink Indicator: REJECT

Humidity Indicator Accept vs. Reject Criteria

Figure 17

C. An easy to read PBE Inspection Flow Charts is provided in this manual. **Deviation from the recommended inspection method for your particular PBE is not covered by the factory warranty, and is the sole responsibility of the operator.**

(1) For Model Number: MR-10022NAF, refer to **Figure 8 on page 21** for your method of inspection.




INSPECTION AND FAULT ISOLATION FLOW CHART

Figure 8

D. Statement of Warranty for Protective Breathing Equipment (PBE)

Essex Industries D/B/A Essex PB&R Corporation warrants that: (1) The Essex Crewmember PBE (hereinafter referred to as the "unit") meets the requirements of FAA TSO-C116 and TSO-C99; and (2) The Essex Crewmember PBE is, and will remain free from defects in material and workmanship, whether patent or latent, for up to the replace by date which is a period of ten (10) years and six (6) months from the date of manufacture when properly stowed aboard aircraft in containers supplied or approved by Essex Industries D/B/A Essex PB&R Corporation.

For those units equipped with a humidity indicator, the loss of vacuum in the inner packaging does not render the PBE unserviceable. Units with barrier pouches that have lost vacuum remain serviceable as long as the humidity indicator remains blue. Although if a unit is found to have a damaged barrier pouch, e.g. cut, puncture or other damage, the unit should be pulled from service and sent back for repair at the customer's expense.

The liability of Essex Industries D/B/A Essex PB&R Corporation for any defect in any unit, and the sole and exclusive remedy of the buyer, shall be limited to the repair or replacement of the defective unit, or a refund of the original purchase price (pro-rated in proportion to the ten (10) year and six (6) month warranty) at the sole discretion of Essex Industries D/B/A Essex PB&R Corporation. The obligation to repair, replace, or provide a pro-rated refund shall terminate ten (10) years and six (6) months after the date of manufacture of the unit.

This warranty is in lieu of all other warranties and representations, expressed or implied, and all other obligations and liabilities of Essex Industries D/B/A Essex PB&R Corporation. Correction of defects, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of Essex Industries D/B/A Essex PB&R Corporation whether based on warranty, tort, contract or otherwise. Under no circumstances shall Essex Industries D/B/A Essex PB&R Corporation be liable for any punitive, special, incidental or consequential damages.

This warranty shall not apply to any unit that has been stowed in an unauthorized container, which has been repaired or altered by anyone other than Essex Industries D/B/A Essex PB&R Corporation, or which has been subject to misuse due to negligence or accident, or the failure to use the unit in accordance with the User Reference and Procedures Manual supplied by Essex Industries D/B/A Essex PB&R Corporation.

**THE FOREGOING WARRANTIES ARE IN LIEU OF ALL WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION ON THE PART OF ESSEX INDUSTRIES D/B/A ESSEX PB&R CORPORATION.**

E. Return Procedures

(1) Before returning any unit for repair, replacement or evaluation, call Essex Industries dba Essex PB&R Corporation at (314) 351-6116, or at 1-800-296-7587 (U.S. only) to obtain a Return of Material Number (ROM). To expedite handling, supply the following information:

(a) Product Model Number(s)

(b) Quantity to be returned

(c) Reason(s) for return

(2) Address all shipments to:

Essex Industries D/B/A Essex PB&R Corporation
4150 Carr Lane Court
St. Louis, MO 63119

(3) Freight on all shipments is to be prepaid.

(4) Shipping instructions will vary depending on mode of shipment.

(a) For domestic or international air shipments:

(i) Bill of lading description (**Ref. Figure 9 on page 24** for an example of a complete shipper's declaration for dangerous goods):

Life saving appliances, not self-inflating, UN3072

(ii) Hazard labeling (IATA/ICAO):

Miscellaneous Class 9

(iii) Hazard Marking (IATA/ICAO):

Life saving appliances, not self-inflating, UN3072

(b) For domestic highway shipments:

(i) Bill of lading description:

Life saving appliances, not self-inflating, UN3072

(ii) Hazard labeling (DOT): None
(iii) Hazard Marking (DOT):

Life saving appliances, not self-inflating, UN3072

| Proper Shipping Name | Class or Division | UN or ID Number | Subsidiary Risk | Net Quantities | Packing Instructions |
|---|---|---|---|---|---|
| Life saving appliances, not self-inflating, UN3072 | 9 | UN3072 | | __* x 0.248 kg | 955 |

* Enter number of units shipped to calculate total net quantity.

## Example of Complete Shipper's Declaration for Dangerous Goods

Figure 9

## 3. REPAIR

A. General

(1) The Essex Crewmember PBE is not an owner repairable system. (**Ref. para. 2.D. on page 22 for the statement of warranty, and 2.E. on page 23 for return procedures**).

(2) Minor maintenance repairs can be accomplished by the owner on stowage containers to refit broken, torn or missing tamper-evident seals, or to realign serviceable equipment within their stowage containers.

B. Refitting Broken, Torn or Missing Tamper-Evident Seals

(1) The PBE Model # MR-10022NAF uses the "Type C" tamper-evident labels.

Refer to **Figure 2 on page 10** for the tamper-evident label part number to be used for ordering seals from Essex PB&R that need replacement.

(2) For "Type C" tamper-evident labels found on closed stowage containers, follow these steps:

(a) Remove and discard the torn label(s).

(b) Remove any residual adhesive to provide a clean, dry surface.

(c) Position and affix the new label(s) so that the perforation on the label aligns with the top edge of the lid. There should be about 0.5 in (13 mm) clearance between the label(s) and the hinge side of the container **(See Figure 2 on page 10).**

## 4. INSTALLATION AND ASSEMBLY

A. Mounting Locations

(1) Locate each Essex Crewmember PBE within 3 ft (.9m) of a required fire extinguisher on board the aircraft, according to applicable FAA or airline regulations. All mounting locations should comply with FAR 45.15, and should be approved by the FAA or other regulatory authority before actual use.

Verify each mounting location for adequate clearance, especially behind seats and in overhead compartments, for ease of inspection, and for removing the pouch quickly during emergency use. A force of approximately 18-28 pounds will be required to lift the lid, breaking the tamper-evident seals. Allow for adequate access.

(2) Mount the unit either vertically or horizontally. There should be at least 15 in (38 cm) of clearance between the stowage case opening and any surrounding structures or equipment.

(3) Mount the unit on a continuously flat (not curved) surface that is free of screw heads, anchors, hinges, knobs or other protrusions that could damage either the sealed pouch or the stowage container.

B. Installation Steps

**WARNING: INSPECT EACH NEW UNIT FOR SERVICEABILITY BEFORE INSTALLING.**

(1) Internal-Mounted Stowage Case Installation (MR-10022NAF)

(a) Remove the Essex Crewmember PBE equipment from its shipping box and inspect it.

(b) Secure the stowage case to the existing mounting holes using the four access holes in front of unit for tool insertion. If mounting holes do not exist reference internal maintenance procedures for machining the holes. The top two anchors or lag screws should be able to support at least 30 lbs (14 kg).

(c) Place the Essex Crewmember PBE into the container and secure the slide latch or clasp to lock stowage container. Verify that the humidity indicator can be seen through the window. Install the tamper-evident seals to each side of the bracket. Install hole plugs into front access holes when installation is complete. (Reference Photos Below.)

## 5. THE ESSEX CREWMEMBER PBE TRAINING UNIT

A. Introduction

(1) The Essex Crewmember PBE training unit (MR-10021N) is designed to help teach how to activate, don and doff the equipment correctly.

(2) This section reviews the differences between an Essex Crewmember PBE training unit and a live unit, how to practice putting on the training hood, and how to properly care for the training unit. When practicing with the Essex Crewmenber PBE Trainer, it is recommended that the special, disposable, sanitary hood liner be used for good personal hygiene (**Ref. para. 5.C. (1) below**).

(3) Essex has performed Endurance Cycle Testing and have determined that the PBE Trainers, if cycled properly as recommended by Essex in this manual, will last a minimum of 200 cycles (excluding damage to the replaceable Neck Seal). Essex recommends that a Usage Log be kept for each PBE Training Unit (reference Figure 12).

B. Operating Features

There are several major differences between the training unit and a live unit.

(1) The training unit is reusable.

(a) A sanitary plastic liner protects the user from unsanitary conditions while wearing the training hood, allowing full visibility, and protecting the hood from possible damage.

**WARNING: DISCARD THE SANITARY LINER AFTER EACH USE.**

(b) The training unit has two empty, non-functioning oxygen cylinders. The training unit is designed to mimic a live unit. Because there is no oxygen in the training unit, the hood has breathing holes.

(c) There are no Carbon Dioxide and no Service/End-of-Service Indicator in the training unit.

C. Operating Steps

(1) Plastic Training Liner (Optional)

Sanitary plastic liners, P/N CP3205, can be ordered from Essex PB&R.

Adjust the plastic liner so that its top paper edge is horizontal at the tip of the nose, and the crease is centered vertically in the middle of the face.

Fold the liner's rear pleat over, then secure it with ordinary cellophane-type tape (**Ref. Figure 11 on page 31**).

(2) General Sequence of Steps

To open the training unit hood, follow the same sequence as for a live unit but with the differences described in steps (a) through (d) below.

(a) Remove the pouch containing the hood from its storage bag.

(b) Open the pouch. Separate the two empty oxygen bottles with the same motions that would be used for a live unit. This simulates activating the oxygen system for the hood. The training unit uses spring clips to mimic the resistance of a live unit's valves.

**WARNING: WHEN USING THE OPTIONAL TRAINING LINER, HOLD THE HOOD DIRECTLY OVERHEAD WHEN DONNING IT. DISTURBING THE LINER CAN INTERFERE WITH VISION OR IMPAIR BREATHING (Ref. Figure 11 on page 31).**

(c) Open the neck seal of the unit, by inserting both hands into opening of neck seal, with palms facing each other. (**Ref. para. 1.C. (5) on page 15**). Spread the neck seal apart with back of hands, as with a live unit. Next, unlike a live unit, hold the training unit directly overhead and lower it straight down over the plastic hood liner. Remove hands from neck seal opening. Have a qualified observer check the hood and liner for proper placement.

(d) Remove the hood by inserting hands, with palms facing front of neck, up and into the neck seal opening and pulling neck seal opening up and over head. Discard the liner when the practice session is complete.

(e) Remove the hood and discard the liner when the practice session is complete.

(3) Verbal communication with the training hood with an interphone, megaphone and microphone are similar to the live hood. (**Ref. Figures 1A and 11 on pages 9 and 31 respectively**).

D. Replacing Torn or Damaged Neck Seals

(1) Replacement neck seals, P/N CP2126, can be ordered from Essex PB&R.

(2) To replace a torn or damaged neck seal follow these steps:

(a) On the inside of the hood, using an Allen Wrench, remove the socket head caps screws, and washer(s) from the valve stems. Remove the oxygen cylinders and felt washers from the neck seal and red slings.

(b) Remove the damaged neck seal by disconnecting the Hook and Loop fastener attachment.

(c) Attach the Hook and Loop Fastener from the new neck seal to the hood making sure to orientate the neck seal with the two valve holes facing the sides of the hood and towards the back of the hood. See **Figure 10 on page 30** for proper placement of the neck seal.

(d) Reinstall oxygen cylinders.

E. Maintenance Procedures

**CAUTION: TREAT THE TRAINING UNIT WITH CARE SO AS NOT AFFECT ITS DURABILITY.**

(1) Clean and disinfect the training hood periodically so it will continue to work effectively.

(a) Moisten a cotton cloth with 50-50 mixture of alcohol and water.

(b) Wipe all inside and outside surfaces. Let dry.

(2) Clean and disinfect the neck seal periodically so it will continue to work effectively.

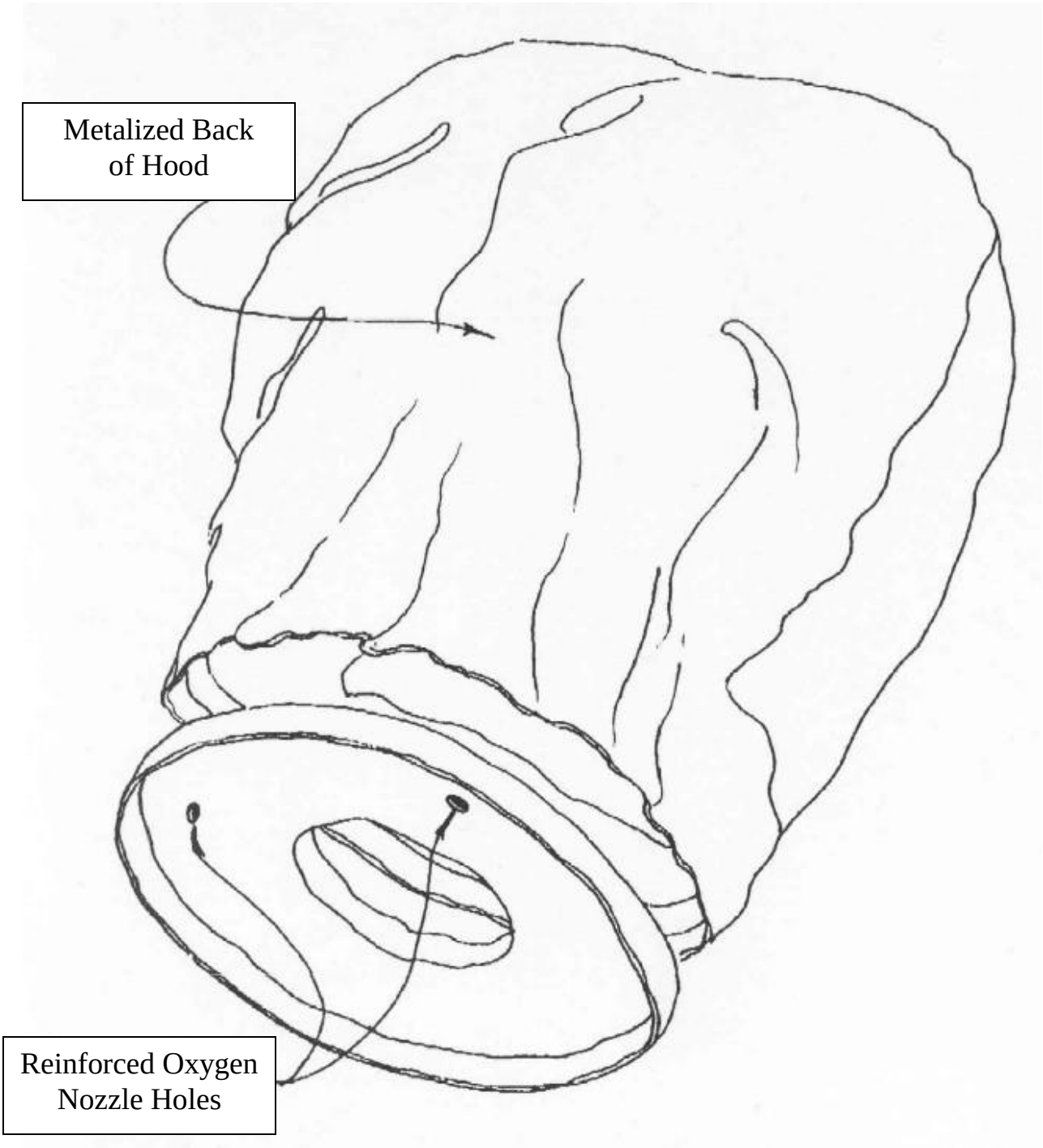
(a) To clean the neck seal, soak a cotton cloth with a commercially available disinfecting cleaner.

(b) Wipe all inside and outside surfaces. Let dry.

F. Handling and Storage

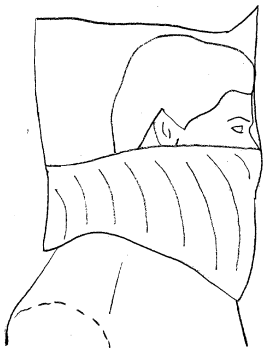
(1) Fold the training unit hood so that there is a long crease up the back. Next fold the front peak of the hood. Finally, fold the hood in half.

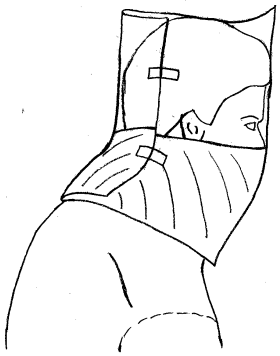
(2) Insert the folded training unit into the storage bag. Store the folded training unit in a suitable location.



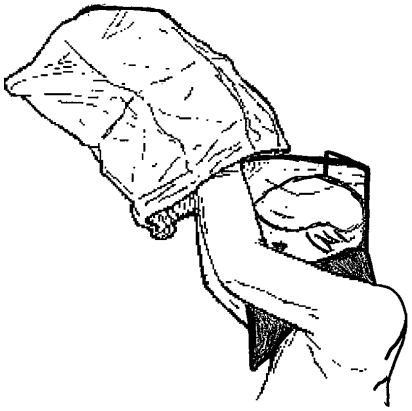

Proper Placement of Replaceable Neck Seal

Figure 10





Donning the Plastic Training Liner (Disposable)



Donning the Training Unit
over the Training Liner

Verbal Communication
using the Interphone

Use of the Training Liner & Training Hood

Figure 11

| Essex PBE Trainer Usage Log | | |
|---|---|---|
| Essex PBE Trainer Serial Number | | |
| Training Date | Number of Training Cycles Performed | Comments |
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PBE Trainer Usage Log Sample

Figure 12