

## CHAPTER 5A

# BELOW-THE-NECK (BTN) CLOTHING, AIRCREW MEMBER, CBR PROTECTIVE USING CHEMICAL PROTECTIVE UNDERSHIRT, CMU-34/P AND CHEMICAL PROTECTIVE DRAWERS, CMU-35/P

### Section 5A-1. Description

#### 5A-1. GENERAL.

5A-2. Considered the below-the-neck (BTN) portion of respirator assemblies, BTN components are items of clothing and cover. They are designed to complement and enhance the respirator assembly function of protecting aircrewmembers against chemical and biological agents and the effects of nuclear fallout. Included in the BTN ensemble are the following items. See figure 5A-1.

#### NOTE

In this discussion the below-the-neck protective assemblies are referred to as BTN ensemble, or ensemble.

- Chemical Protective Undergarment
- Chemical Protective Socks
- Disposable Footwear Covers
- Aircrew Cape
- Chemical Protective Gloves
- Chemical Glove Inserts

5A-3. Included in the chapter are descriptive and maintenance information including fitting, storage and cleaning instructions. An illustrated parts listing is also provided.

#### NOTE

Aircrew may have difficulty operating small knobs/switches when wearing chemical protective gloves.

#### 5A-4. CONFIGURATION.

5A-5. The Below-the-Neck components include items described in paragraphs 5A-6 through 5A-11. Table 5A-1 shows the protective factors for each of the items in the BTN ensemble.

**5A-6. CHEMICAL PROTECTIVE UNDERGARMENTS.** The chemical protective undergarments consist of an undershirt and a drawer. The fabric is composed of a non-woven material with encapsulated carbon in a stretchable matrix. The chemical protective undergarments, when worn under the flight suit, are somewhat resistant to water, petroleum, oils, and lubricants; however, gross contamination by these POLs may degrade chemical protection. Service life of the undergarments out of the vapor-barrier package is 15 days. The undergarments provide protection from liquid and vapor chemical threat for up to 12 hours after contamination.

**5A-7. CHEMICAL PROTECTIVE SOCKS.** The chemical protective socks are made of 4-mil polyethylene. They are vapor agent impermeable, which protects the feet from chemical agents. They come in one size only, and are meant to be worn over cotton socks inside the flyer's boots. The socks are disposable items for one-time use.

**5A-8. DISPOSABLE FOOTWEAR COVERS.** The footwear covers are worn over the flyer's boots. They protect the aircrewmember from contamination en route between the shelter and the aircraft. They must be removed before entering the aircraft. The footwear covers come in three sizes, medium, large, and extra large as indicated in table 5A-2.

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**5A-9. AIRCREW CAPE.** The aircrew cape is a large, clear, disposable, 4-mil polyethylene bag worn over the body. The cape protects the aircrewmember from liquid contamination en route between the shelter and the aircraft and must be removed before entering the aircraft. It is available in one size only as indicated in [table 5A-2](#).

**5A-10. CHEMICAL GLOVE INSERTS.** The chemical glove inserts are white, 100% cotton knit and come in three sizes, as shown in [table 5A-2](#). The inserts must be worn under the chemical protective gloves to absorb perspiration. The T3 Insert is a charcoal color and must be issued as a set with the black color T3 Glove ([paragraph 5A-11](#)).

### NOTE

T3 Gloves/Inserts are issued as a set (left insert glove, right insert glove, left NOMEX glove, right NOMEX glove).

**5A-11. CHEMICAL PROTECTIVE GLOVES.** The chemical protective gloves protect hands from chemical agents. They are made of butyl, are 7-mil, 12 inches long or 14-mil, 14 inches long. The gloves come in four sizes as shown in [table 5A-2](#). They are designed for an estimated seven day service life, for twelve hours per day. The T3 Glove is black with extended gauntlet and must be issued with the T3 Insert.

### NOTE

Aircrew may have difficulty with operating small knobs/switches when wearing chemical protective gloves.

### NOTE

Butyl 7-Mil thick, 12 inch long glove is the preferred CB protective glove for flight.

## 5A-12. APPLICATION.

5A-13. The clothing ensembles provide protection against chemical and biological warfare agents. They are worn by aircrewmembers in addition to the applicable aircrewmember flight equipment configuration (see NAVAIR 13-1-6.7 Series).

## 5A-14. FUNCTION AND OPERATION.

5A-15. The respirator assemblies, when worn with the standard flight equipment, provide protection as follows:

1. Head, eye and respiratory system protection is provided by:

- Mask/Hood/Orinasal Mask
- Pusher Fan Subassembly
- Filtered Oxygen Supply (on units so equipped)

2. BTN body protection is provided by:

- Chemical Protective Undergarments (worn over personal underwear)
- Chemical Glove Inserts
- Chemical Protective Gloves
- Chemical Protective Socks

3. Standard aircrewmember protection is provided by NAVAIR 13-1-6.7-2 aircrewmember summer configuration.

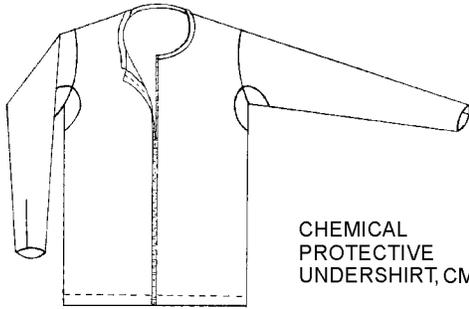
4. Aircrewmembers are protected from contamination between the shelter and the aircraft by:

- Aircrew Disposable Polyethylene Cape
- Disposable Vinyl Footwear Covers

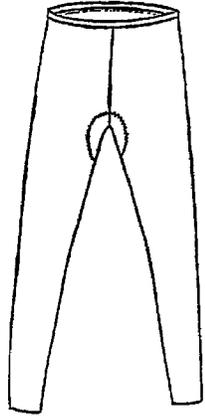
**5A-16. COMPONENTS** Refer to [table 5A-2](#) for leading particulars for the BTN ensemble.

Table 5A-1. Aircrew BTN Clothing CBR Protection Factors

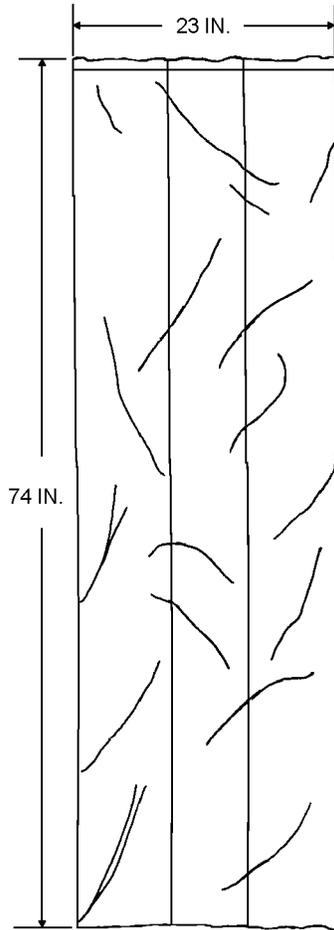
Item	Material	Uncontaminated Service Life
Chemical Protective Undergarments (Note 1)	Carbon/Aramid/Polyester/Lycra Non-woven	15 Days
Protective Socks	4-Mil Clear Polyethylene	One Time Use
Chemical Glove Inserts (Notes 3, 4, and 5)	100% Cotton Knit	No Limit
Protective Gloves (Notes 3, 4, and 5)	7- or 14-Mil Butyl Rubber	Eighty-four (84) Hours
Disposable Footwear Covers (Note 2)	4-Mil Clear Polyethylene	One Time Use
Aircrew Cape (Note 2)	4-Mil Clear Polyethylene	One Time Use
<p>Notes:</p> <ol style="list-style-type: none"> <li>Item is worn over personal underwear, no cotton long underwear is worn.</li> <li>Doffed prior to aircraft ingress and disposed of. Upon return to base, aircraft captain issues new foot-wear covers and aircrew cape which are donned upon aircraft egress, and worn to ensemble doffing area.</li> <li>T3 Gloves/Inserts are to be issued as a set and are authorized to be used in place of 100% cotton knit inserts and 7- or 14-mil butyl rubber gloves and GS/FRP-2 Fire-Resistant Flyer's Gloves. Uncontaminated Service Life: TBD.</li> <li>Contaminated Service Life: If the 14-mil Butyl Chemical Protective Gloves become contaminated, replace them within 24 hours after exposure.</li> <li>Contaminated Service Life: If the T3 Inserts become contaminated, replace them within 6 hours after exposure.</li> </ol>		



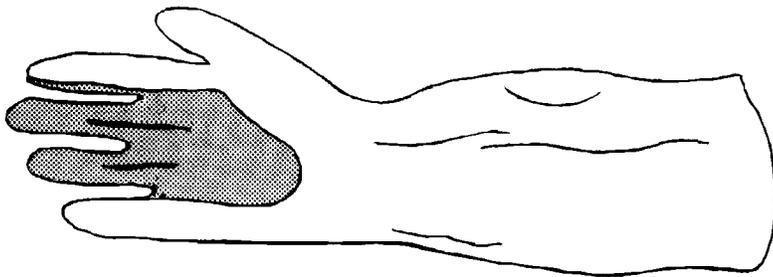
CHEMICAL PROTECTIVE UNDERSHIRT, CMU-34/P



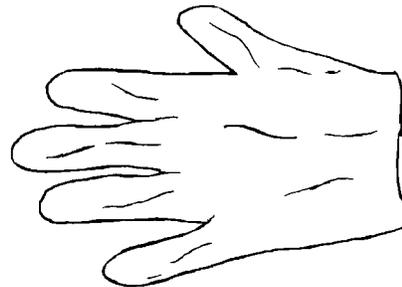
CHEMICAL PROTECTIVE DRAWERS, CMU-35/P



AIRCREW CAPE



CHEMICAL PROTECTIVE GLOVES



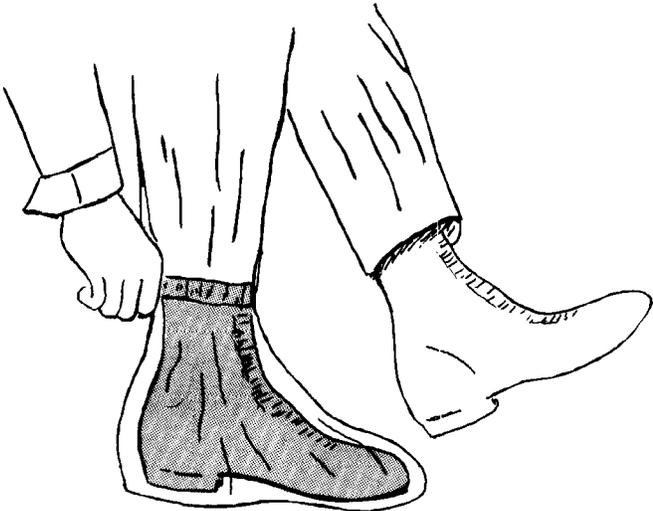
CHEMICAL GLOVE INSERT

5a-1-1

Figure 5A-1. Aircrew Chemical Defense BTN Ensemble Using Chemical Protective Undergarments (Sheet 1 of 2)



CHEMICAL PROTECTIVE SOCKS



DISPOSABLE FOOTWEAR COVERS

5a-1-2

Figure 5A-1. Aircrew Chemical Defense BTN Ensemble Using Chemical Protective Undergarments (Sheet 2 of 2)

Table 5A-2. Aircrew BTN Clothing Components

Available Item	NSN	Sizes	Remarks
Chemical Protective Undershirt, CMU-34/P	8415-01-490-1900	30	May be laundered once during its 15-day wear cycle.
	8415-01-490-1901	32	
	8415-01-490-1902	34	
	8415-01-490-1903	36	
	8415-01-490-1904	38	
	8415-01-490-1908	40	
	8415-01-490-1910	42	
	8415-01-490-1911	44	
	8415-01-490-1913	46	
	8415-01-490-1914	48	
	8415-01-490-1915	50	
8415-01-490-1917	52		
Chemical Protective Drawers, CMU-35/P	8415-01-490-4368	26	May be laundered once during its 15-day wear cycle.
	8415-01-490-4371	28	
	8415-01-490-4372	30	
	8415-01-490-4374	32	
	8415-01-490-4376	34	
	8415-01-490-4378	36	
	8415-01-490-4379	38	
	8415-01-490-4380	40	
	8415-01-490-4381	42	
	8415-01-490-4382	44	
	8415-01-490-4383	46	
	8415-01-490-4384	48	
Chemical Protective Socks	8415-01-040-3169	One Size	Disposable (one-time use only) (500 each per roll) (Unit of issue is, each, not by pair)
Disposable Footwear Covers	8430-00-591-1359	Medium	Disposable (one-time use only)
	8430-00-580-1206	Large	
	8430-00-580-1205	X-Large	
Aircrewmember's Cape	8415-01-040-9018	One Size	Disposable (one-time use only) (100 each per roll)

**Table 5A-2. Aircrew BTN Clothing Components (Cont)**

Available Item	NSN	Sizes	Remarks
Chemical Protective Gloves	8415-01-138-2501 8415-01-138-2502 8415-01-138-2503 8415-01-138-2504 8415-01-138-2497 (Not <a href="#">ESD</a> <a href="#">3rd</a> ) 8415-01-138-2498 (Not <a href="#">ESD</a> <a href="#">3rd</a> ) 8415-01-138-2499 (Not <a href="#">ESD</a> <a href="#">3rd</a> ) 8415-01-138-2500 (Not <a href="#">ESD</a> <a href="#">3rd</a> )	Small Medium Large X-Large Small Medium Large X-Large	
Chemical Glove Inserts	8414-01-138-2494 8415-01-138-2495 8415-01-138-2496	Small Medium Large	
T3 Gloves/Inserts	0001AA, T3GLOVE/INSERT 0002AB, T3GLOVE/INSERT 0003AC, T3GLOVE/INSERT 0004AD, T3GLOVE/INSERT	Small Medium Large X-Large	Order from respective TYCOM.
Notes: 1. 14-Mil Gloves, Chemical Protective, Part Number: MIL-G-43976. 2. Aircrew summer flyer's gloves may need to be increased by one or two sizes when wearing the chemical protective gloves. Refer to NAVAIR 13-1-6.7-2 if applicable.			

## Section 5A-2. Modifications

### 5A-17. GENERAL.

5A-18. There are no modifications authorized to the BTN ensemble at this time.

## Section 5A-3. Fitting, Donning, and Doffing

### 5A-19. GENERAL.

5A-20. The concept of fitting in this section follows the normal sequence of events and includes initial fitting and preparation, donning, doffing an uncontaminated BTN assembly and doffing a contaminated assembly.

#### NOTE

A Technical Data Indoctrination Package is available for CBR Buildup, Fitting and Donning, PIN# 113924. It is available in VHS, CD, DVD or electronically on the PMA-202 Website [HTTPS://pma202.navair.navy.mil/](https://pma202.navair.navy.mil/). For further information, contact your FAILSAFE Representative or Aeromedical Safety Officer.

### 5A-21. INITIAL FITTING.

5A-22. Initial fitting includes guidelines for fitting the chemical protective undershirt and drawers, chemical protective socks, disposable footwear covers, and glove inserts. All equipment sizes shall be entered on the appropriate OPNAVINST 4790.2 Series form.

**5A-23. FITTING OF CHEMICAL PROTECTIVE UNDERGARMENTS.** The chemical protective undergarments are to be worn close to the body, next to the skin, over personal underwear and under the CWU-27/P flight suit. Choose the chemical protective undershirt and drawers size correctly based upon [Table 5A-3](#). The garments come packaged separately so that undershirts and drawers can be individually fit based upon the aircrewmember's measurements. The undershirt has expandable wrist openings with hook and loop closures and a full-length slide fastener. The trousers have an elastic waistband and tapered legs. The undershirt is worn outside of the trousers and extends to hip level. The sleeves and legs of the garments are not to be trimmed.

**5A-24. FITTING OF CHEMICAL PROTECTIVE GLOVES AND CHEMICAL GLOVE INSERTS.** The glove shall be issued as a set. See [Table 5A-2](#) for available sizes of chemical protective gloves and glove inserts. The aircrewmember should first try on the chemical glove inserts to get a snug, but not restrictive fit. Next, the chemical protective gloves shall be tried on over the chemical glove inserts.

Again, the fit should be snug but not restrictive. Avoid issuing bulky or oversized gloves because the gloves must integrate properly with the GS/FRP-2 fire resistant flyer's gloves. To determine the glove size of the T3 Gloves/Inserts, measure the width of your hand at the widest point between the knuckles on your hand and inside the thumb (do not include the thumb). Cross reference measurements in accordance with the following: small 3.0 in. and below, medium 3.1 to 3.4 in., large 3.4 to 3.6 in., and X-large 3.6 and above.

**5A-25. FITTING OF DISPOSABLE FOOTWEAR COVERS.** The aircrewmember should try on the disposable footwear covers over the flight boots to find the best fit.

**5A-26. FITTING OF CHEMICAL PROTECTIVE SOCKS.** The chemical protective socks come in one size only. No fitting is required.

### 5A-27. DONNING.

#### NOTE

Donning of Respirator Assembly and below-the-neck clothing shall be supervised by a qualified Aircrew Survival Equipmentman, MOS 6060, in accordance with OPNAVINST 4790.2 Series.

Materials Required		
Quantity	Description	Reference Number
1	Respirator Assembly	See <a href="#">Note</a>
1	HGU Series Helmet	—
1	CWU-27/P Flight Suit	MIL-C-83141
1 Pair	Aircrewmember's Boots	MIL-B-21408 MIL-B-24911
1	Survival Vest	—
1	Torso Harness (if required)	—
1	Anti-g Garment (if required)	—
1	Life Preserver Unit	—

Table 5A-3. Chemical Protective Undershirt and Drawer Sizing

Chemical Protective Undershirt (Note 1)		
Chest Size (inches)	Corresponds To Undershirt Size	
<30	30	
31-32	32	
33-34	34	
35-36	36	
37-38	38	
39-40	40	
41-42	42	
43-44	44	
45-46	46	
47-48	48	
49-50	50	
51-52	52	
Chemical Protective Drawers (Note 2)		
Waist (Inches)	Hip (Inches)	Corresponds to Drawer Size
25-26	34	26
27-28	36	28
29-30	40	30
31-32	42	32
33-34	42	34
35-36	44	36
37-38	46	38
39-40	48	40
41-42	50	42
43-44	52	44
45-46	54	46
47-48	56	48
Notes: 1. If individual hip measurement is larger than chest measurement, use the hip measurement to select size. 2. If measurements indicate different sizes, select larger size drawers.		

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### Materials Required (Cont)

Quantity	Description	Reference Number
1 Pair	GS/FRP-2 Fire Resistant Flyer's Gloves	MIL-G-81188
1	Chemical Protective Undershirt	CMU-34/P (see <a href="#">Table 3A-2</a> )
1	Chemical Protective Drawers	CMU-35/P (see <a href="#">Table 3A-2</a> )
1 Pair	Chemical Glove Inserts	see <a href="#">Table 3A-2</a>
1 Pair	Chemical Protective Gloves	see <a href="#">Table 3A-2</a>
1 Pair	Chemical Protective Socks	NIIN 01-040-3169
1 Pair	Disposable Footwear Covers	see <a href="#">Table 3A-2</a>
1	Aircrew Cape	NIIN 01-040-9018
1 Pair	Cotton Socks	—
1 Pair	Prescription ARS Spectacles (if required)	ARS 6540
1	2 Qt. Water Canteen	NIIN 01-118-8173
1	M-1 Canteen Cap	NIIN 00-930-2077
1	Canteen Cover	NIIN 01-118-8175
1	Skull Cap (if desired)	—
1	Sweat Band (if desired)	—
As Required	Powder, Talc	—

### NOTE

Refer to [Chapter 3](#) for information on the A/P23P-14A(V) Respirator Assembly.

Refer to [Chapter 4](#) for information on the A/P22P-14(V)1 thru A/P22P-14(V)4 Respirator Assemblies.

### 5A-28. DONNING THE RESPIRATOR ASSEMBLY AND ASSOCIATED EQUIPMENT.

To provide maximum protection, the donning sequence given for the BTN ensemble must be followed. The Aircrew Survival Equipmentman will supervise the

aircrewmembers while they are donning the ensemble. Since every second counts in a chemical/biological attack, it is imperative that the users as well as the Aircrew Survival Equipmentmen become proficient in assembly donning procedures. The donning procedure is as follows:

### NOTE

Detailed procedure for fitting respirator assemblies covered in this manual are found in [Chapter 3](#) or [4](#).

1. Ensure all normal flight equipment, BTN ensemble, and respirator assembly components are on hand and serviceable before beginning to don the protective assembly. Ensure pre-flight equipment checks have been completed and oxygen-configured respirator assemblies are correctly prepared.

2. Ensure that the in-flight communications cords are properly attached to the mask breathing hose (if applicable). The ground communications cord is not compatible with the aircraft cockpit intercom connection, except for some KC-130 aircraft.

3. Aircrewmembers requiring the use of the in-flight amplifier AM-3597C/A need to have each end of the amplifier wrapped with 6 to 8 inches of electrical tape to ensure the amplifier does not disconnect from the helmet/mask communication cords. Electrical tape should be loosely wrapped around the amplifier at this time so the tape will be available for final wrapping of the amplifier upon ingress into the cockpit.

4. Don the protective socks over the aircrewmembers' socks. The protective socks should be positioned so that no excess material is under the foot and so that the seam is flat on the floor in front of the foot. Fold excess material around the foot. Masking tape may be used to hold folds around the foot. Fold excess material smoothly along the calf. Masking tape may be used to secure the protective sock to the calf and ensure that they remain properly positioned and tucked under the chemical protective drawers pant leg.

5. Don the chemical protective drawers over cotton underwear.

6. Don the chemical protective undershirt over the cotton undershirt. Pull slide fastener fully closed.

7. Don the flight suit and close the slide fastener to the abdomen.

8. Don the flight boots. The bootlaces should be completely loosened to facilitate donning the protective socks. Tuck the chemical protective drawers into the top of the boots prior to tightening up the boot laces. The flight suit should be worn pulled down over the outside of the boots.

8A. Don the anti-g suit and don the torso harness to the waist.

9. Don personal prescription Aircrew Respirator Spectacles (ARS 6540) if vision correction is required.

10. Don a skullcap and/or sweat band (optional). Use of an absorbent skullcap and/or sweat band will improve comfort and keep perspiration from running into the eyes.

11. Check that the respirator assembly hood outlet valve is open (out).

12. Turn the pusher fan ON to supply breathing air and prevent misting of the visual area of the faceplate.

13. Don the mask:

### WARNING

When donning the mask do not overextend or damage the neck seal.

a. While the assistant maintains the position of the ARS, sweat band, and skull cap with their hand, place the mask assembly over the head. One method is to grasp the neck seal with both hands, open it fully, place the front of the neck seal under the chin, and pull the neck seal and hood back over the head. A second method is to insert both hands into the neck seal and spread it open wide enough to slide it directly down over the head. The assistant will hold the manifold and lower assembly during this process.

b. Situate the mask for comfort and maximum visibility. The lower lip of the orinasal mask should rest between the lower lip and chin.

c. The assistant will ensure that the neck seal lies flat on the neck and is not rolled or bunched.

d. Test exhalation valve assembly. Request wearer to exhale; ensure air flows from the exhalation

valve assembly to the environment. Pinch-off mask inlet hose and request the wearer to inhale; wearer should experience an inability to breathe. Release hose.

e. Ensure the aircrewmember is familiar with the location of the anti-suffocation disconnect and faceplate ripaway tab or toggle and their operation.

### CAUTION

Ensure shoulder skirt material does not catch in the slide fastener and neck bellows remains outside of flight suit collar. Be sure shoulder skirt is not tucked in too tightly, as this can restrict mobility.

14. While the aircrewmember holds the pusher fan, battery pocket and oxygen related equipment, as applicable, the assistant will tuck shoulder skirt of respirator assembly under flight suit at the shoulders. To maximize comfort and mobility, ensure the skirt lies flat and that neck bellows remains near but outside flight suit collar. After positioning skirt, close the flight suit slide fastener to the neck.

15. Don the torso harness by placing arms through torso harness and zipper and buckle.

16. Don the survival vest.

a. While the aircrewmember holds pusher fan, battery pocket or overvest, as applicable, the assistant will don the vest on the aircrewmember and close slide fastener.

b. The assistant will attach pusher fan and battery pocket to survival vest or don the CBR overvest CMU-29(V)2P on the aircrewmember.

c. The assistant will engage the hooks and assist in any adjustments. Ensure hoses lie on the outside of survival vest.

### NOTE

A very light dusting of talc on the outside of the hood or a second thin skullcap can be used to facilitate helmet donning.

17. Don the flight helmet.

a. Turn the pusher fan OFF; deflate hood.

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b. Place flight helmet on the head over respirator assembly's hood. To maximize field of view, don the helmet fore to aft to minimize hood material slack in the temple area. The faceplate should lie within the helmet edge roll.

c. The assistant will assist in securing and adjusting chin and nape straps as required.

d. Check for proper operation of helmet visor.

e. Turn pusher fan ON.



Ensure intercommunications set is turned off prior to removing or installing batteries.

18. Connect and check the intercommunications unit for proper operation:

### NOTE

The AM-3597C/A amplifier, if installed, must be temporarily removed for the intercommunications unit to operate properly.

a. Connect intercom unit to mask microphone and aircrew helmet with the appropriate ground communication cords as shown in figure 4-17.

b. Check for proper operation by actuating the intercommunications unit and alternately speaking and listening. Secure the intercommunications unit to the survival vest by clipping the snap hook to one of the upper D-rings located on the survival vest.

19. Secure mask to helmet and adjust toggle harness:



For proper retention of the helmet, the toggle harness must lie over hooks provided on V-bow.

a. The assistant will connect CBR adapter straps to helmet. The toggle harness cables shall lay over the hooks on the faceplate.

b. Position mask, then rotate V-bow down to lock into flight position.

c. Adjust harness tension to obtain a good seal between mask and the face by rotating V-bow up, turning adjustment sleeves on each harness wire, then rotating V-bow down to check tension and fit; repeat as often as necessary. To provide a comfortable fit, ensure there is equal tension on both sides of mask.

### NOTE

Check for proper fit by clamping hood inlet hose shut by using finger and thumb pressure while the filtered air supply is flowing. While holding breath, check to see if air is leaking out from the edge of the mask. Readjustment of toggle harness may be required to assure a good seal and comfortable fit.

d. Ensure proper operation of nose occluder. If unable to valve, valve replacement instructions b, c and d, or recheck nose occluder as shown in Chapter 3 or 4, as applicable.



The canteen is not authorized for in-flight use in ejection seat aircraft.

Keep the drink facility quick disconnect plugged into a canteen or its holder to reduce the chance of contamination.

Disconnect the drink facility quick disconnect from the canteen by pulling and twisting, and plug it into its holder prior to emergency egress.

20. Hang a filled canteen and pouch on the right side of the aircrewmember using the strap provided. The assistant will help in routing the canteen strap, ensuring strap does not interfere with hoses and communications cords. The strap should be placed on the left shoulder, then routed across the body to the right side of aircrewmember. The canteen cap should face forward. Remove drink facility quick disconnect from its holder and attach it to canteen by snapping up flap on top of the M-1 canteen cap using a firm twisting motion to push it into the receiver fitting of cap. Wetting canteen cap will facilitate connection.

**NOTE**

When donning the canteen and strap, be certain to use a qualified PR or helper for proper canteen strap routing. The canteen strap is routed UNDER the respirator hoses and intercom cord and OVER the left shoulder, clear of the life preserver lobes. The canteen is worn on the right side with the canteen cap facing forward.

21. Roll up flight suit and chemical protective undershirt sleeves and don the gloves:

**WARNING**

T3 Inserts shall not be cut for any reason.

**NOTE**

Material between the glove fingers may be cut or split approximately one half inch between the “V” of each finger to increase flexibility.

a. Don the cotton glove inserts or the T3 Inserts.

**NOTE**

If using T3 Inserts, skip step b.

b. Don the butyl protective gloves. Ensure gloves are pulled all the way onto the hands and arms and lie smoothly on the arms.

c. Roll down the chemical protective undershirt sleeves and secure velcro around the protective gloves and wrist.

d. Don flight gloves. Roll down flight suit sleeves over flight gloves, and secure at the wrists using flight suit’s velcro tabs.

**WARNING**

Donning and doffing the aircrew protective cape may generate static electricity. Caution shall be taken when working with sensitive electrical components or around jet fuels or other flammable vapors.

22. Don disposable footwear covers and aircrew cape in a liquid threat environment.

**CAUTION**

When removing and discarding aircrew-member’s disposable protective capes and footwear covers, care shall be exercised to ensure they are not drawn into jet engine air intakes.

**NOTE**

See NAVAIR A1-NBCDR-OPM-000 for information on aircraft ingress and egress.

23. On arrival at aircraft, the aircrewmember’s protective cape and footwear covers shall be doffed and discarded outside aircraft to prevent contaminating the aircraft.

24. Protective footwear covers and capes shall be available to the aircrew for return trip from aircraft to shelter.

**5A-29. DOFFING AN UNCONTAMINATED ENSEMBLE.**

5A-30. Aircrewmembers should doff an uncontaminated ensemble in the following order:

**NOTE**

When feasible, a qualified Aircrew Survival Equipmentman (PR) or other trained assistant shall assist the aircrewmember in doffing the CBR protective assembly.

**Materials Required**

Quantity	Description	Reference Number
As Required	M-8/M-9 Detector Paper	NIIN 01-049-8982

**WARNING**

Do not handle suspected contaminated items unless wearing chemical protective equipment. Failure to wear proper protective clothing may result in disability, serious injury, or death.

Aircrewmembers must be checked with M-8/M-9 detection paper for contamination prior to assuming they are uncontaminated.

Personnel wearing contaminated equipment shall report to the nearest decontamination station for removal of contaminated systems.

1. Remove protective cape and footwear covers. These shall be disposed of by an Aircrew Survival Equipmentman.

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2. Doff canteen. Remove drink facility quick disconnect from the M-1 canteen cap, and replace quick disconnect in its holder.

3. Open velcro tabs on flight suit sleeves and remove flight gloves. Remove CBR protective gloves and cotton glove inserts.



Ensure microphone cords are fully unplugged. If not, damage to microphone and/or cords can occur. Do not tug cord to unplug.

4. Disconnect microphone lead of the mask from the pigtail on the back of the helmet. Remove the communications cord from the pigtail and the intercommunications unit. This turns the unit off. Unclip the intercommunications unit snap hook from the D-ring on vest.

5. Remove helmet mounted devices (e.g., NVIIS) and raise all visors.

6. Rotate the V-bow on mask to the UP position.

7. The assistant will remove CBR adapter straps from helmet.

8. Unsnap helmet chin strap and doff helmet.

9. With the assistant's help, separate the pusher fan and battery pocket from survival vest. This is accomplished by pulling to the right on the ribbon, which releases the locking pin of the quick release assembly on the rear of pocket.

10. With aid of the assistant, open survival vest slide fastener, unhook leg lines, and doff survival vest. Remove anti-g garment and torso harness as applicable.

11. Open flight suit slide fastener to waist level and remove the shoulder skirt of respirator from under flight suit.



When doffing mask assembly do not overstretch and/or damage the neck seal.

12. Doff mask by inserting thumbs under neck seal in front, then stretch and lift the mask up over face and to the back. A second method is to insert thumbs under neck seal from the back, then stretch and lift mask over the back of the head toward the front. Leave pusher fan on to maintain airflow to mask.

13. Doff skull cap, sweat band, and ARS (if worn).

14. Remove flight boots.

15. Remove remainder of flight suit.

16. Doff chemical protective undergarments. Return to Aircrew Survival Equipmentman for inspection and verification of remaining service life.

17. Take off chemical protective socks and cotton underwear. The chemical socks shall be disposed of by an Aircrew Survival Equipmentman.

### 5A-31. DOFFING A CONTAMINATED ENSEMBLE.



Do not handle suspected contaminated items unless wearing chemical protective equipment. Failure to wear proper protective clothing may result in disability, serious injury, or death.

5A-32. Aircrewmembers in contaminated equipment must report to the nearest decontamination station to doff the contaminated equipment.

#### NOTE

Refer to U.S. Navy CBR Defense/U.S. Marine Corps NBC Defense Handbook (OPNAV P-86-1-95) and Operational Instructions, Naval Aviation, Nuclear, Biological and Chemical (NBC) Defense Resource Manual (NAVAIR A1-NBCDR-OPM-000) for additional information concerning donning and doffing contaminated individual protective equipment.

## Section 5A-4. Maintenance

### 5A-33. GENERAL.

5A-34. This section contains the procedures for inspection, cleaning, and storage of the below-the-neck (BTN) items.

**5A-35. ENVIRONMENTAL CONSIDERATIONS.** All maintenance and storage operations shall be conducted in a clean area.

### 5A-36. INSPECTIONS.

#### NOTE

Only a small quantity of BTN ensembles shall be opened or removed for in-flight proficiency training and for fitting aircrew.

**5A-37. PLACE-IN-SERVICE INSPECTION.** The Place-in-Service Inspection shall be performed on the BTN ensemble by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, prior to placing in service. The inspection shall include unpacking, visual inspection, and functional checks and shall be performed at the lowest maintenance level possible. The Place-in-Service Inspection shall not be performed on war reserve items until there is a need to issue the items. War reserve items shall remain in protective packaging while in storage. To perform the Place-in-Service Inspection, proceed as follows:

1. Remove the items of the BTN ensemble from the packaging.

2. Check the BTN ensemble for cuts, tears, holes, separations at the seams, abrasions, fungus, deterioration, stains or any other evidence of damage which would degrade performance.

3. Check slide fastener on the chemical protective undershirt for proper operation in both directions.

4. Mark training assets in accordance with OPNAVINST 4790.2 Series.

5. Perform fitting specified in paragraph 5A-23.

6. Document in accordance with OPNAVINST 4790.2 Series.

**5A-38. PREFLIGHT INSPECTION.** The Preflight Inspection for proficiency training BTN ensembles shall include a visual examination to ensure that all items of the ensemble are present and in good condition prior to donning. The visual inspection shall be performed by the aircrewmember. The Preflight Inspection of war reserve ensembles shall consist of the same visual inspection as the training ensembles and include a check by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, to ensure that the service life has not expired. To perform the inspection, proceed as follows:

1. Check the appropriate OPNAVINST 4790.2 Series form for Time-in-Service of the chemical protective undergarment and the chemical protective gloves. Ensure that the Time-in-Service, when added to the expected time of the upcoming mission, does not exceed the service life. If the service life is exceeded, dispose of the item and issue a new item. Time-in-Service for the chemical protective undergarments is limited to 15 days. Time-in-Service for the protective gloves is estimated at seven days when worn for 12 hours a day.

2. Check the BTN ensemble for cuts, tears, holes, separations at the seams, abrasions, fungus, deterioration, stains, Petroleum, Oil, and Lubricants (POL) contamination, excessive odor, or any other evidence of damage which would degrade performance.

**5A-39. POSTFLIGHT INSPECTION OF WAR RESERVE BTN ENSEMBLES.** The Postflight Inspection of War Reserve BTN Ensembles shall include a contamination check, visual inspection, functional check of slide fastener, cleaning, and recording of time in service. The inspection shall be performed by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, at the lowest maintenance level possible. To perform the Postflight Inspection, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	M-8/M-9 Detector Paper	NIIN 01-049-8982
As Required	Talc	—

**WARNING**

Anyone handling suspected contaminated items must wear chemical protective equipment. Failure to wear proper protective equipment may result in disability, serious injury or death.

1. Check the War Reserve BTN Ensemble with M-8/M-9 Detector Paper for contamination. If contamination is present, contact the NBC Officer immediately for further instructions. If contamination is not present, continue with Postflight Inspection.

2. Dispose of the aircrew cape, chemical protective socks, and the footwear covers.

3. Check the service life of chemical protective undergarment and chemical protective gloves. Dispose of them if the service life is expired or is within four hours of expiration.

4. Inspect remaining items of BTN ensemble for cuts, tears, holes, separation at the seams, abrasion, fungus, deterioration, stains, POL contamination, excessive odor, or any other evidence of damage which would degrade performance. Dispose of any items that are beyond repair and cleaning limits listed in [paragraph 5A-44](#).

5. Check slide fastener on the chemical protective undershirt for proper operation in both directions.

**NOTE**

The chemical protective undergarments and protective gloves must be dry before returning to storage.

6. Hang chemical protective undergarments to air dry in a sheltered area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

7. Wipe dry the inside and outside of chemical protective gloves. Apply a light dusting of talc to prevent sticking.

8. Launder chemical glove inserts, chemical protective undershirt, and chemical protective drawers in accordance with [paragraph 5A-42](#). The chemical protective undershirt and drawers may be laundered an unlimited number of times during training life.

9. Issue new items to replace all items that were disposed.

10. Document service time of the war reserve BTN ensemble in accordance with OPNAVINST 4790.2 Series.

**5A-40. POSTFLIGHT INSPECTION OF TRAINING BTN ENSEMBLES.** The Postflight Inspection of Training BTN Ensembles shall include a visual inspection, a functional check of the slide fastener, and cleaning. The Postflight Inspection shall be performed by qualified Aircrew Survival Equipmentman (PR), MOS 6060, at the lowest maintenance level possible. To perform the Postflight Inspection, proceed as follows:

1. Dispose of aircrew cape, chemical protective socks, and footwear covers.

2. Inspect the remaining items of BTN ensemble for cuts, tears, holes, separations at the seams, abrasion, fungus, deterioration, stains, POL contamination, odor or any other signs of damage which would degrade performance. Dispose of any items which are beyond repair and cleaning.

3. Check slide fastener on the chemical protective undershirt for proper operation in both directions.

**NOTE**

The chemical protective undergarments and the chemical protective gloves must be dry before returning to storage.

4. Hang chemical protective undergarments to air dry in a sheltered area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

5. Wipe inside and outside of chemical protective gloves dry.

6. Issue new items to replace any items which were disposed.

7. Launder chemical glove inserts, chemical protective undershirt, and chemical protective drawers in accordance with [paragraph 5A-42](#). The chemical protective undershirt and drawers may be laundered an unlimited number of times during training life.

8. Document in accordance with OPNAVINST 4790.2 Series.

**Table 5A-4. Shelf Life of BTN Ensemble Items**

Part	Shelf Life Code	Time in Years
Chemical Protective Undershirt	9	8
Chemical Protective Drawers	9	8
Chemical Protective Socks	0	NA
Chemical Glove Inserts	0	NA
Chemical Protective Gloves	9	5
Disposable Footwear Covers	0	NA
Aircrew Cape	0	NA

**5A-41. SHELF LIFE INSPECTION.** BTN ensemble items should be checked regularly to ensure their capability to protect the user. Table 5A-4 provides the shelf life of assembly items. Type II items with a shelf life of 60 months or more are coded 9. Those items with a non-deteriorative storage time period are coded 0.

**5A-42. CLEANING AND SERVICE LIFE.**

5A-43. Cleaning procedures for noncontaminated BTN equipment are listed as follows:

1. The chemical protective socks, footwear covers and aircrewmember's cape are one-time-use items. These items shall be disposed of after one use. Cleaning of these items is not required.

2. In a noncontaminated environment, the chemical protective undergarments have a service life of 15 days of wear. Maximum agent exposure during their service life shall be a one-time 12-hour agent exposure limit. The chemical protective undergarments are launderable once during their 15-day wear life.

**NOTE**

Prior to laundering and drying, make sure all slide fasteners are engaged and hook and pile tapes are fastened.

3. The chemical glove inserts, chemical protective undershirt, and chemical protective drawers are launderable. They should be machine laundered in detergent, rinsed, and dried at the coolest setting to prevent shrinkage. The chemical glove inserts shall be laundered after each use. The chemical protective undershirt and drawers may be laundered once during their 15-day wear life.

4. The chemical protective gloves are washable. Wash as necessary to remove petroleum products (oils, lubricants, etc.). The gloves may be sponge wiped with detergent and warm water, rinsed and air dried. Apply a light dusting of talc to prevent tacky surface. The chemical protective gloves have a service life of 7 days at 12 hours per day. If the time in service exceeds either the 12 hours per day (period of use) or the 7 days of use, dispose of gloves and issue a replacement pair.

5. The T3 Glove/Insert can be washed for hygienic purposes during the 14 day service life. The 14 day service life may be extended to 15 days. Proper care and cleaning instructions in a non-contaminated environment are as follows:

a. The outside of the glove and glove insert may be washed while the product is being worn. Simply hand wash the outside of glove with mild soap and water like one is washing their hands. Rinse with clean water. Always dry the glove slowly away from places of extreme heat, like hot radiators, stove or fire boxes.



The following step must be strictly followed to ensure that the insert is not damaged.

b. The inside of the glove insert may be cleaned with a disinfecting solution. Disinfecting solution may be made from laundry bleach by thoroughly mixing a solution of 1.5 oz of laundry bleach with 1 gallon of water to provide approximately 600 ppm available chlorine by weight. Fill inside of glove to within 3

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inches of the cuff opening with disinfecting solution. Close off cuff and shake vigorously for approximately 10 seconds. Pour out solution and squeeze out excess solution, from fingertips down to cuff. Rinse with water after treatment. To dry, carefully invert glove insert as much as possible at cuff opening and allow to air dry.

c. The glove may be cleaned with the same disinfecting solution. Immerse the entire glove in the disinfecting solution for 30 seconds. Stir in the solution for 10 seconds, leave the glove in the solution for an additional 30 seconds. Rinse with water after treatment. To dry, squeeze out excess of water, from fingertips down to cuff. Dry slowly away from places of extreme heat, like hot radiators, stoves or fire boxes.

d. Using the recommended procedure above, washing everyday up to the recommended life of the glove should not degrade its performance.

e. Drying time will vary depending on room temperature and relative humidity present.

### 5A-44. DECONTAMINATION.

#### WARNING

Anyone handling suspected contaminated items must wear chemical protective equipment. Failure to wear the proper protective equipment may result in disability, serious injury, or death.

5A-45. Dispose of all contaminated BTN equipment in accordance with NBC procedures.

### 5A-46. REPAIRS.

5A-47. Modifications to the chemical protective equipment listed in this chapter are not authorized. Corrective maintenance actions to the chemical protective gloves, inserts, socks and footwear covers are not authorized. Corrective maintenance for rips and seam openings is authorized to the chemical protective undergarments. Sewing repairs may be performed at the lowest possible maintenance level.

1. To mend a ripped seam, overlap the two edges and hand sew or 301 machine stitch with straight, small stitches.

2. To repair a tear, place the two edges together and neatly hand sew using a whip stitch.

3. To mend a frayed edge, turn the frayed edge under and hand sew or 301 machine stitch the turned edge.

4. To perform a field expedient repair, sew or field tape the garment.

a. Sewing. Loosely whip stitch a rip or tear, keeping the seam as flat as possible. Trim all thread ends.

b. Field taping. Keeping rip or tear as flat as possible, tape over the puncture using duct tape or other tape sufficient to patch. Cut the appropriate size of tape to cover the rip or tear. Round the edges of the tape to reduce fraying. Place the tape over the rip or tear and press firmly.

### 5A-48. STORAGE.

5A-49. Store in clean, dry area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

## Section 5A-5. Illustrated Parts Breakdown

### 5A-50. GENERAL.

5A-51. This section lists and illustrates the detailed components of aircrewmembers' CBR Protective BTN clothing. The IPB is intended for use in identification, procurement, and the issuance of replacement components.

### NOTE

For more complete information on the IPB and Group Assembly Parts List, refer to [Chapter 2](#), [Section 4](#), [NAVSUPINST 4423.29](#), [OPNAVINST 4410.2A](#), and [NAVSUP P-719](#).

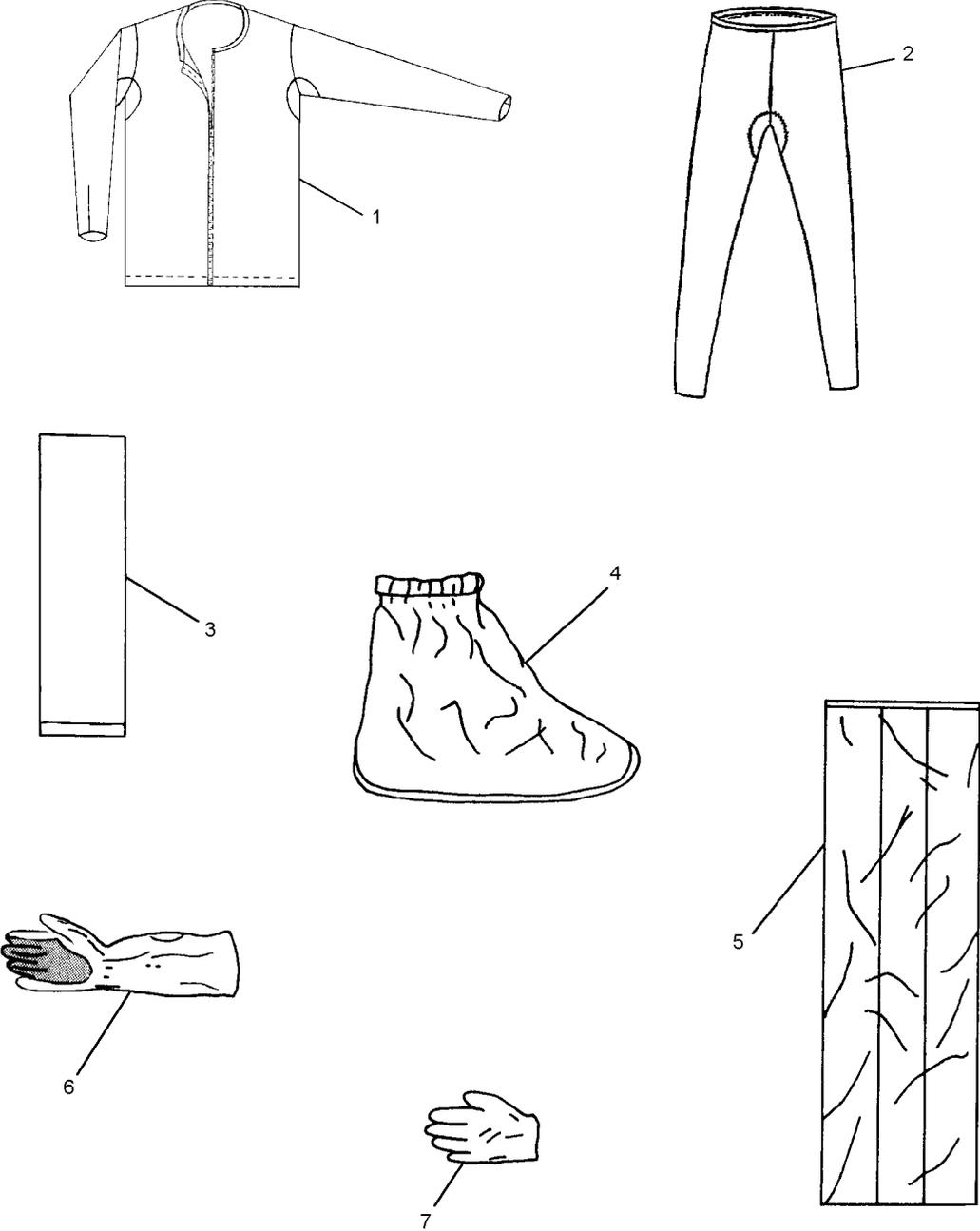


Figure 5A-2. Below-the-Neck (BTN) Clothing, CBR Protective Using Chemical Protective Undergarments

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Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
5A-2		BELOW-THE-NECK (BTN) CLOTHING, . . . . . CBR PROTECTIVE	REF	
-1	8415-01-490-1900	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 30	1	
	8415-01-490-1901	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 32	1	
	8415-01-490-1902	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 34	1	
	8415-01-490-1903	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 36	1	
	8415-01-490-1904	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 38	1	
	8415-01-490-1908	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 40	1	
	8415-01-490-1910	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 42	1	
	8415-01-490-1911	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 44	1	
	8415-01-490-1913	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 46	1	
	8415-01-490-1914	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 48	1	
	8415-01-490-1915	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 50	1	
	8415-01-490-1917	. UNDERSHIRT, CHEMICAL PROTECTIVE . . . . CMU-34/P, SIZE 52	1	
-2	8415-01-490-4368	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 26	1	
	8415-01-490-4371	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 28	1	
	8415-01-490-4372	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 30	1	
	8415-01-490-4374	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 32	1	
	8415-01-490-4376	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 34	1	
	8415-01-490-4378	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 36	1	
	8415-01-490-4379	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 38	1	
	8415-01-490-4380	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 40	1	
	8415-01-490-4381	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 42	1	
	8415-01-490-4382	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 44	1	
	8415-01-490-4383	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 46	1	
	8415-01-490-4384	. DRAWERS, CHEMICAL PROTECTIVE . . . . . CMU-35/P, SIZE 48	1	

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
5A-2-3	8415-01-040-3169	.							RO	
-4	8430-00-580-1205	.							PR	
	8430-00-591-1359	.							PR	
	8430-00-580-1206	.							PR	
-5	8415-01-040-9018	.							RO	
-6	8415-01-138-2501	.							PR	
	8415-01-138-2502	.							PR	
	8415-01-138-2503	.							PR	
	8415-01-138-2504	.							PR	
-7	8415-01-138-2494	.							PR	
	8415-01-138-2495	.							PR	
	8415-01-138-2496	.							PR	

## NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
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Part Number	Figure and Index Number	SM&R Code
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8415-01-040-3169	5A-2-3	PAOZZ
8415-01-040-9018	5A-2-5	PAOZZ
8415-01-138-2494	5A-2-7	PAOZZ
8415-01-138-2495	5A-2-7	PAOZZ
8415-01-138-2496	5A-2-7	PAOZZ
8415-01-138-2501	5A-2-6	PAOZZ
8415-01-138-2502	5A-2-6	PAOZZ
8415-01-138-2503	5A-2-6	PAOZZ
8415-01-138-2504	5A-2-6	PAOZZ
8415-01-490-1900	5A-2-1	PAOZZ
8415-01-490-1901	5A-2-1	PAOZZ
8415-01-490-1902	5A-2-1	PAOZZ
8415-01-490-1903	5A-2-1	PAOZZ
8415-01-490-1904	5A-2-1	PAOZZ
8415-01-490-1908	5A-2-1	PAOZZ
8415-01-490-1910	5A-2-1	PAOZZ
8415-01-490-1911	5A-2-1	PAOZZ
8415-01-490-1913	5A-2-1	PAOZZ

8415-01-490-1914	5A-2-1	PAOZZ
8415-01-490-1915	5A-2-1	PAOZZ
8415-01-490-1917	5A-2-1	PAOZZ
8415-01-490-4368	5A-2-2	PAOZZ
8415-01-490-4371	5A-2-2	PAOZZ
8415-01-490-4372	5A-2-2	PAOZZ
8415-01-490-4374	5A-2-2	PAOZZ
8415-01-490-4376	5A-2-2	PAOZZ
8415-01-490-4378	5A-2-2	PAOZZ
8415-01-490-4379	5A-2-2	PAOZZ
8415-01-490-4380	5A-2-2	PAOZZ
8415-01-490-4381	5A-2-2	PAOZZ
8415-01-490-4382	5A-2-2	PAOZZ
8415-01-490-4383	5A-2-2	PAOZZ
8415-01-490-4384	5A-2-2	PAOZZ
8430-00-580-1205	5A-2-4	PAOZZ
8430-00-580-1206	5A-2-4	PAOZZ
8430-00-591-1359	5A-2-4	PAOZZ