

**MUSTANG SURVIVAL
TACTICAL DRY SUIT SYSTEM,
MUSTANG MODEL MSF300**

**DESCRIPTION AND MAINTENANCE INSTRUCTIONS
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1.0 INTRODUCTION

1.1 GENERAL

- 1.1.1 This manual provides information on the hazards of cold-water immersion, the function and features of the Mustang Survival Tactical Aircrew Dry Suit System Model MSF300. Also included are test, maintenance and repair instructions to assist qualified Life Support Equipment Technicians.
- 1.1.2 Read this manual thoroughly to become familiar with the operation of the zippers, pockets and seals. The lives of crewmembers may depend on the condition of the MSF300. Keep the manual in a convenient location for easy reference in the event that the suit requires inspection, repair or cleaning.
- 1.1.3 This manual consists of nine sections, each organized into a number of subsections (see the Table of Contents).

1.2 CONTACT

- 1.2.1 For further information concerning this manual or the suit, contact:

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1.3 RIGHTS RESERVED

- 1.3.1 US Patent No. 6,668,386 Canadian Patent No.2,381,720 - ADJUSTABLE NECK SEAL
- 1.3.2 Velcro™ is a trademark of American Velcro™ Inc.
- 1.3.3 GORE-TEX® is a registered trademark of W. L. Gore and Associates.
- 1.3.4 Nomex® and Cordura® are registered trademarks of DuPont™ Corporation.

1.4 RESPONSIBILITIES

- 1.4.1 The individual to whom the suit is issued or assigned, following internal training, assumes responsibility for pre and post use inspections and for returning the suit to the Life Support Equipment shop for periodic inspection and testing on required dates.
- 1.4.2 Each operational organization is responsible for the instruction and survival training of all MSF300 users in the following:
 - a. Fitting of the Tactical Dry Suit System



- b. Purpose, use and operation of all accessories
 - c. Importance and method of visual pre and post use inspections
- 1.4.3 The Life Support Equipment shop is responsible for:
- a. Inspection upon first issue from the supply depot or contractor
 - b. Ensuring the suit is complete and serviceable prior to issue
 - c. Periodic inspection and testing of the suit (see section 7.4)
 - d. Maintenance, cleaning and repair when required
 - e. Requisitioning and maintaining stocks of spare parts
 - f. Maintenance of inspection records for all Mustang Survival MSF300 units

1.5 DESCRIPTION

1.5.1 Application

1.5.1.1 The MSF300 Tactical Dry Suit System may be used in lieu of traditional dry suits and anti-exposure work suits when a suit of greater durability, comfort and protection from exposure to cold is required.

1.5.1.2 Built to endure the most extreme operating environments, the MSF300's revolutionary two-layer modular system is a result of Mustang's ongoing commitment to research and development. Crewmembers may use the MSF300 when operating in conditions requiring dry suit use. The MSF300 is designed for over-water helicopter operations or any other tactical operations where the environment dictates the need for increased hypothermia protection.

1.5.2 Protection

1.5.2.1 Mustang's patented breathable closed cell (PVC) foam not only aids in the moisture management system, but it also provides inherent buoyancy and the basis for hypothermia protection, even in the event of damage to the suit.

1.5.3 Comfort

1.5.3.1 The Thermal Liner (MA7246) is constructed of our patented breathable closed-cell foam. The Thermal Liner is engineered with multiple apertures, then quilted using wicking fabrics, designed to pull excess moisture vapor (sweat) away from the wearer's body.

1.5.3.2 The Outer Shell (MA7345) uses three-layer textured urethane Nomex fabric, designed to allow the escape of excess moisture vapor while providing a waterproof barrier to the outside elements. Adjustable wrist and neck seals aid in the system's delivery of superior comfort and flexibility, reducing heat stress and fatigue associated with long or strenuous operations. The patented CCS™ Closed Comfort System adjustable neck seal, and redesigned trim-to-fit neoprene wrist seals improve the comfort of flight crews during extended missions.

1.5.4 Durability

1.5.4.1 The MSF300's Outer Shell is reinforced in high abrasion areas (knees and seat) with even more rugged urethane coated Mil-spec panels for abrasion. Proven durability results in extended service-life when compared to that of traditional latex neck and wrist seals.



1.5.5 Configuration

- 1.5.5.1 The MSF300 provides hypothermia protection and inherent buoyancy using two interconnected modules forming a single system. Each module may be repaired, to a degree, or replaced individually.

Figure 1. MSF300 Tactical Dry Suit System Layers



Thermal Liner – MA7246

Outer Shell – MA7345

- 1.5.5.2 The first module is a breathable foam liner, which provides hypothermia protection and flotation while reducing heat stress. The innermost Thermal Liner is constructed of ultra-soft, polyvinylchloride (PVC) closed-cell foam and incorporates our patented “Breathability System”. These features lead to life cycle cost savings when compared to traditional flight crew dry suits.
- 1.5.5.3 The second module is the Outer Shell and provides the suit with watertight integrity and the equivalent protection of a dry suit. The outer fabric of the MSF300 is a Nomex/Gore/Nomex laminate. The outer layer is MIL-C-83429B, Type 2, Class 6 Nomex fabric 4.3 OZ (Most commonly used for CSU 13 B/P G suits and flight coveralls). The flame-resistant aramid cloth is a waterproof, but moisture vapor permeable polytetrafluoroethylene (PTFE) membrane. The suit’s moisture permeable characteristics reduce heat stress, providing greater efficiency for the wearer.
- 1.5.5.4 This module’s sleeve openings maintain watertight integrity with neoprene seals. The Outer Shell’s neck seal is constructed of a waterproof, polyurethane/polycarbonate-coated nylon stretch material and is closed via an adjustable, elastic drawstring system that effectively seals



water outside the module and allows personnel to wear the suit comfortably. The module is fitted with waterproof socks.

NOTE: Appropriate thermal undergarments (such as polypropylene underwear) should be worn to enhance the protection afforded by the MSF300 and assist in wicking moisture away from the body.

1.5.6 Fit

1.5.6.1 This suit is available in five sizes.

SIZE	CHEST CIRCUMFERENCE		WAIST		INSEAM	
XS	30" - 34"	76 - 86 cm	28"	71 cm	27"	69 cm
S	34" - 38"	86 - 96 cm	28" - 30"	71 - 76 cm	27.5"	70 cm
M	38" - 42"	96 - 106 cm	32" - 34"	81 - 86 cm	31"	79 cm
L	42" - 46"	106 - 116 cm	36" - 38"	91 - 96 cm	32"	81 cm
XL	46" - 50"	116 - 127 cm	40" - 42"	102 - 106 cm	33"	84 cm
XXL	50" - 54"	127 - 137 cm	44" - 46"	112 - 116 cm	34"	86 cm
XXXL	54" - 58"	137 - 147 cm	48" - 50"	122 - 127 cm	35"	89 cm



2.0 IMMERSION AND ANTI-EXPOSURE CLOTHING

2.1 HAZARDS

- 2.1.1 Cold-water immersion is a life-threatening situation, and your survival depends on the clothing you wear. Cold, shock, hypothermia, loss of dexterity and mental sharpness and drowning are your primary concerns. Many strong swimmers drown within yards of safety in cold water. This suggests that many drown because of the rapid shock of immersion, causing immediate hyperventilation, water ingestion, and often heart failure, which may occur in water below 59°F (15°C).
- 2.1.2 Without adequate buoyancy and insulation, individuals rely on swimming ability and endurance for survival. Your strength and endurance are seriously diminished in colder water, reducing your ability to overcome waves, currents, spray, etc.
- 2.1.3 Hypothermia results when your body loses heat faster than it can be replaced and can occur in any environment below 98.6°F (37°C), our normal body core temperature. Water conducts heat away from our body 25-30 times faster than air, presenting a high risk.
- 2.1.4 Shivering is the body's way of generating heat to replace the lost heat. The smallest blood vessels constrict close to the skin, reducing the blood circulation to your hands and feet. Circulation to the body core is also restricted, where it is needed most, resulting in a loss of dexterity. As the effect of cold increases, muscles weaken and stiffen, leading to the loss of feeling and reduced co-ordination. Your decision-making and thinking processes slow down.
- 2.1.5 Proper clothing reduces many of these hazards, improving your chances of survival. Clothing should provide insulation from the cold and should not hinder mobility. Ensure buoyancy is provided either inherently in your outfit, or with an additional life preserver, preferably both.
- 2.1.6 Generally there are two types of immersion protective clothing:
 - a. Wet suits
 - b. Dry suits

2.2 WET SUITS

- 2.2.1 Wet suits allow some water in, but restrict water movement into and out of the suit. Your body heats up the water that becomes, more or less, trapped in the suit. If the openings of the suit become restricted, the warmed water stays inside the suit longer, reducing heat loss. If a wet suit is damaged or torn, the level of protection is reduced.

2.3 DRY SUITS

- 2.3.1 Dry suits protect you during cold-water immersion by using, in conjunction with garments worn under the suit, the trapped air as an insulation layer from the cold water. Most dry suits utilize seals at the wrists, neck and ankles, unless incorporating gloves and boots. These seals are made from waterproof materials, insulated or non-insulated. The MSF300 Tactical Dry Suit System is a dry suit.



3.0 MSF300 FEATURES

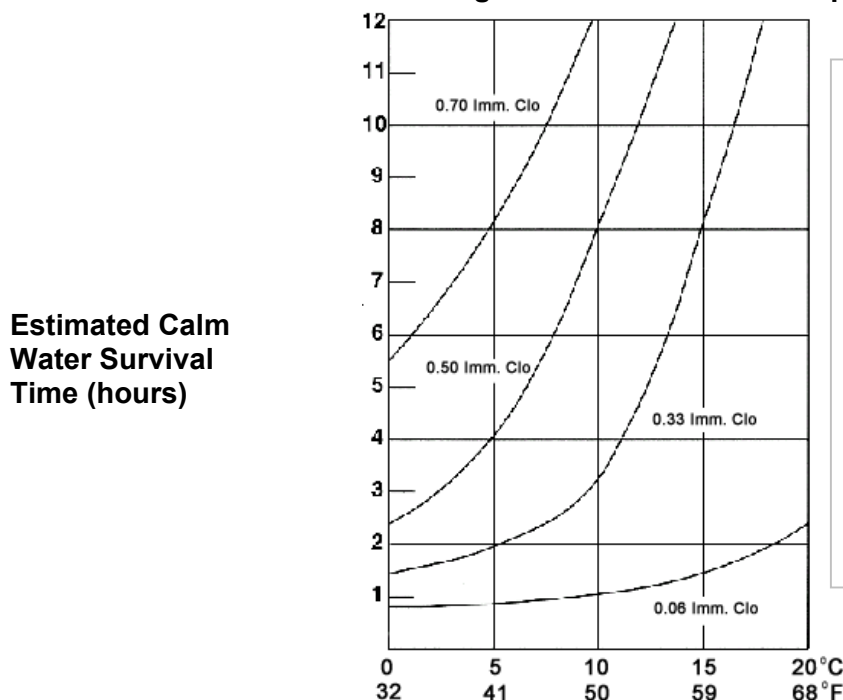
3.1 GENERAL

- 3.1.1 Familiarize yourself with all the features of the suit to maximize its effectiveness. Illustrations are provided as an additional reference.
- 3.1.2 The suit is made of watertight fabric and has neoprene wrist seals and patented adjustable neck seal, a main entry waterproof zipper and a waterproof relief zipper. The suit is watertight and is intended to keep the wearer dry in the event of immersion. Multiple pockets are included for convenient storage.

3.2 HYPOTHERMIA PROTECTION

- 3.2.1 Immersion in cold water is a danger for anyone working on or near the water. The length of time a person can survive in cold water largely depends on both the water's temperature and the thermal protection of their protective clothing.
- 3.2.2 To create the most effective protection against hypothermia, Mustang Survival begins by evaluating the clothing's immersed Clo value, which depicts the level of thermal insulation a garment provides. Clo is a measurement of insulation, much like the 'R' values assigned to fiberglass house insulation. We determine the rate at which heat is lost from the body, as well as the difference in temperature between the skin and the water.
- 3.2.3 Figure 2 indicates random samples of Immersed Clo values and the corresponding estimation of survival time in cold water (assuming a thin person with a 5.5° F (3° C) drop in body core temperature).
- 3.2.4 When tested on a thermally insulated manikin, the MSF300 measures 0.58 Immersed Clo in stirred water. This level of immersion protection provides approximately six hours of survival time in 32° F water temperatures.

Figure 2. Clo Insulation Graph



NOTE: When using Figure 3, keep in mind that the chart was derived empirically by mathematical modeling and conservatively applied to the tenth percentile (thin) individual in calm (stirred) water.

With the complexity of factors involved, there is no guarantee as to the accuracy of the predicted survival time on an individual case basis.



3.3 TESTING

3.3.1 Each MSF300 is tested and proven 100% watertight.

3.4 ASSEMBLED MSF300

Figure 3. Component Locations



3.5 FEATURES

- Patented CCS™ Closed Comfort System adjustable neck seal and neoprene wrist seals provide easy donning and comfort
- Watertight zippers and seams
- Articulated knees for maximum mobility
- Highly abrasion resistant, reinforced seat, and knees

3.5.1 Neck and Wrist Seals

3.5.1.1 The patented watertight adjustable neck and neoprene wrist seals (located on the Outer Shell) are elastic, allowing the user to stretch each seal over their head or hands.



3.5.2 Main Entry Zipper

- 3.5.2.1 The main entry zipper, located on the Outer Shell (see figure 3), is a heavy-duty zipper with nickel-silver teeth that provides a watertight seal when closed and wraps around the upper torso.
- 3.5.2.2 The main entry zipper starts on the front of the suit, under the left armpit, and extends around the back to the front under the right armpit. A nylon thong is attached to the zipper slider, assisting the wearer in opening and closing the zipper.

CAUTION: Avoid snagging your clothing in the zipper, as this may break the zipper's seal.

- 3.5.2.3 The zippers should always be left in the open position while the suit is stored. See section 7.3.2 for zipper care procedures and for recommended zipper cleaners and lubricants.

3.5.3 Relief Zipper

- 3.5.3.1 The relief zipper (see figure 3) is black, with metal teeth and provides a watertight seal when fully closed. It is located on the front of the MSF300 Tactical Dry Suit System and extends down the groin area.
- 3.5.3.2 The zipper closes bottom to top. A nylon thong is attached to the zipper slider, assisting the wearer in opening and closing the zipper.

3.5.4 Hood (MA7148)

- 3.5.4.1 A stored foam-lined thermal hood should be worn when a crewmember wearing the suit enters the water.



4.0 ASSEMBLY

4.1 ASSEMBLY PROCEDURE

- a. First, lay out the Thermal Liner and Outer Shell side by side facing down.

NOTE: Check the labels of the Thermal Liner to ensure they are located on the inside (the seams of the Thermal Liner should face out).

Figure 4. Assembly Step a.



- b. Ensure that the waterproof entry zipper and neck seal adjustment are fully opened.
- c. While maintaining the orientation, lay the Thermal Liner over the Outer Shell.

Figure 5. Assembly Step b.





- d. Keeping the bottom flat and straight, insert each leg of the Thermal Liner down into each leg of the Outer Shell until it reaches the interconnection buckles at the ankle (see figure 6).

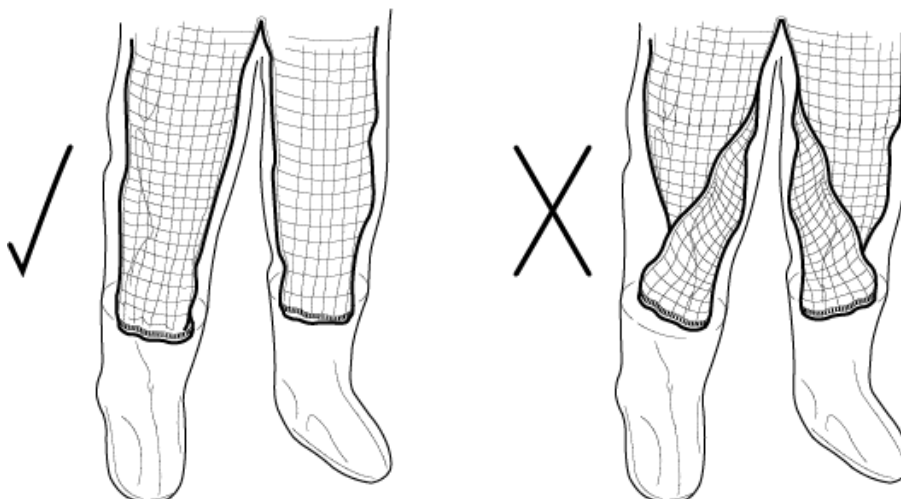
Figure 6. Assembly Step d.



NOTE: Ensure the legs do not twist, maintaining a matching orientation during insertion.

- e. When you've fed the Thermal Liner into the end of the Outer Shell, grasp both layers and pull them out together.
- f. Attach the two buckles on each cuff, connecting the Thermal Liner and the Outer Shell. Ensure that the buckles are aligned properly at the ends of the cuffs for proper connection.
- g. Then, after ensuring that the attachment is complete, push the two pieces back down each leg of the Outer Shell.

Figure 7. Assembly Step c.





- h. Attach the two buckles under each shoulder, connecting the Thermal Liner and the Outer Shell.

Figure 8. Assembly Step h.



- i. Ensure that the buckles are aligned for proper connection. The Thermal Liner should not be twisted.

NOTE: Ensure the Thermal Liner does not twist.

- j. Insert each arm of the Thermal Layer by grasping the arms at the interconnection buckles and pull both arms through the arm of the Outer Shell.

Figure 9. Assembly Step j.



NOTE: Ensure that the arms do not twist. Maintain a matching orientation during insertion.

- k. When you've fed the thermal liner into the end of the outer shell, grasp both layers and pull them out together (for each arm).



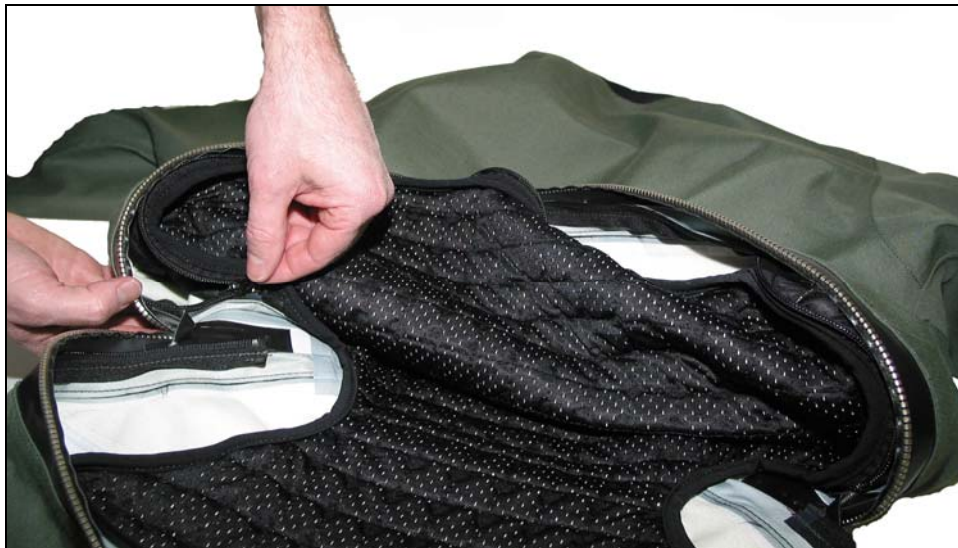
- I. Attach the two buckles on each cuff, connecting the Thermal Liner and the Outer Shell. Ensure that the buckles are aligned properly at the ends of the cuffs for proper connection. The arms of the Thermal Liner should not be twisted.

Figure 10. Assembly Step I.



- m. Then, after ensuring that the attachment is complete, push the two pieces back down each arm of the Outer Shell.
- n. After laying the Outer Shell out flat again, join the Thermal Liner and the Outer Shell. Fasten the upper zippers, connecting the two layers.

Figure 11. Assembly Step n.





- o. Complete the connection of the Thermal Liner and the Outer Shell by fastening the lower zippers.

Figure 12. Assembly Step o.



5.0 DONNING\DOFFING INSTRUCTIONS

NOTE: *The MSF300 may be donned without assistance.*

5.1 SUIT PREPARATION PRIOR TO DONNING

- a. Test the wrist seal for fit. See the Trim to Fit Wrist Seal Instructions, if required.
- b. Completely loosen the neck seal.
- c. Ensure the wrist adjustment Velcro is fully loosened.
- d. Fully open the entry zipper.
- e. Ensure the zipper holding loop and waterproof zipper pull-tab are exposed
- f. Wear socks to minimize wear and tear on the Outer Shell's built-in socks

CAUTION: *Use extreme caution when donning the MSF300. Prior to donning, remove all rings, watches, earrings, necklaces and eyeglasses that will cause damage to wrist and neck seals.*

5.2 TRIM TO FIT WRIST SEAL INSTRUCTIONS

- 5.2.1 Your suit comes equipped with universal-sized wrist seals that have a tapered sealing surface at the end of the cuff. This tapered end allows you to modify the size of the cuff opening to match the physical characteristics of your hand and wrist. Trimming the end of the cuff increases the diameter of the end opening, allowing a larger wrist to be inserted and sealed comfortably without damaging the cuff. Users with unusually boney wrists should try to make



the wrist seal fit properly further up the arm where the sealing surface is smooth. Once the wrist seal is trimmed, it may not provide an adequate seal for a smaller wrist.

5.2.2 **Required materials:** Ruler, sharp scissors and talcum powder. See the bottom of the page for trim to fit wrist seal instructions for used suits.

5.2.3 Trim to Fit Instructions - New Suits

5.2.3.1 The trim table below details recommended "Trim Off" lengths relative to wrist size. To ensure a watertight seal that provides safety, the fit should be slightly uncomfortable without cutting off circulation to your hand. Don't cut off more wrist seal than recommended, otherwise the safety provided may be compromised.

Figure 13. Measure the Wrist



- a. Use a tailor's measuring tape or some other means (string) to determine each wrist circumference (measure just above the wrist joint towards the elbow). Left and right wrist sizes may vary. Measure again to confirm.

Figure 14. Trim Guide

Trim Off	To Fit Wrist
0"	5 1/2" - 6"
1/4"	6 1/2"
1/2"	7"
3/4"	7 1/2"
1"	8"

- b. Refer to the trim table above and determine the recommended "Trim Off" amount. (Eg: a wrist size of 7" requires approximately 1/2" be trimmed from the cuff end)
- c. If wrist circumference is 6" or less, try on the cuff "as is" to gauge the comfort and seal provided. Continue with trimming only if required.
- d. If trimming is required, mark a circular line around the cuff that is offset from the original cuff end by the recommended "Trim Off" amount.



Figure 15. Measure the Sleeve



- e. Using sharp scissors, or a razor, carefully cut the cuff end at the marked line. Evaluate the fit and comfort after each cut. Apply talcum powder to your hand and wrist to make donning the cuff much easier. Don the sleeve by pointing the fingers straight, tucking the thumb underneath and inserting the hand through the seal. Do not make a fist when putting your wrist through the seal. Forcing the wrist through a cuff that is too small may tear the cuff end open.

Figure 16. Cut the Sleeve



- f. If further trimming is required, shorten the cuff end $\frac{1}{8}$ " at a time until the optimum balance of fit and comfort is achieved. It is not recommended to exceed the original cut by more than $\frac{1}{2}$ "
- g. To maximize the protection provided by the wrist seals, try to minimize flexing of the hand-wrist-arm muscles when in the water.

5.2.4 Trim to Fit Instructions - Used Suits

5.2.4.1 The condition of a used suit may not be obvious, so carefully don each of the wrist seals prior to trimming. To ensure a watertight seal that provides safety, the fit should be slightly uncomfortable without cutting off circulation to your hand. Don't cut off more than the required amount, otherwise the safety provided by the wrist seal may be compromised. Perform the following steps to trim the wrist seals of a used MSF300.

- a. Apply talcum powder to your hand and wrist to make donning the cuff much easier.
- b. Don the sleeve by pointing the fingers straight, tucking the thumb underneath and inserting the hand through the seal. Do not make a fist when putting your wrist



through the seal. Forcing the wrist through a cuff that is too small may tear the cuff end open.

- c. If further trimming is required, shorten the cuff end $\frac{1}{8}$ " at a time until the optimum balance of fit and comfort is achieved.
- d. To maximize the protection provided by the wrist seals, try to minimize flexing of the hand-wrist-arm muscles when in the water.

5.3 DONNING INSTRUCTIONS

- a. Pick up the MSF300 and fold the top forward, over the waist.
- b. Slowly slide your legs in until your toes reach the end of the socks (see figure 17).

Figure 17. Donning Step b.



- c. Now insert each arm like this until your hands are completely exposed. Ensure insulating undergarments are not sandwiched between seal and skin.

Figure 18. Donning Step c.



NOTE: The MSF300 cuffs may require trimming (see section 5.2).



- d. Bring the upper portion of the suit over your head, aligning the neck opening with the top of the head. Reach inside the top of the neck seal with the fingers and gently pull the seal outward and down as you push your head through. Ensure insulating undergarments are not sandwiched between seal and skin.

Figure 19. Donning Step d.



4.3.1 Closing the Waterproof Entry Zipper

- a. Grasping the waterproof entry zipper donning strap with your left hand, begin pulling the zipper slider with your right hand to start to close the waterproof zipper, continuing to close the zipper as far as possible.
- b. Switch hands, and with your left hand grasp the zipper slider and continue closing the waterproof zipper until it is completely closed while holding the donning strap with your right hand to gain leverage.
- c. Ensure the waterproof relief zipper is completely closed.

WARNING: Failure to completely close the waterproof entry zipper and the relief zipper will result in leakage of water inside the suit and reduction of in-water survival time. Have a fellow crewmember double-check each slide fastener to ensure they are completely closed against their sealing plugs.

5.4 ADJUSTING THE MSF300 AFTER DONNING

- a. Adjust the neck seal to a snug but comfortable fit. Do not tighten the neck seal to a point of discomfort (see figure 20).



Figure 20. Adjusting the Neck Seal



**Drawstring
Securing Tab**

- b. Secure the ends of the neck seal drawstring to the tab located at the outer edge of the neck seal.
- c. Adjust the wrist Velcro.

5.5 SECURING THE MSF300 IN EMERGENCY SITUATIONS

5.5.1 General

5.5.1.1 In the event of entering the water, the MSF300 has a number of emergency features that are crucial to your survival.

5.5.2 Neck Seal

5.5.2.1 After entering the water, tighten the neck seal by grasping the drawstrings and pulling the tabs out and away from the neck until a snug, comfortable fit is achieved.

5.5.3 Wrist Seals

5.5.3.1 The neoprene wrist seals prevent the entry of water into the suit.

5.6 DOFFING PROCEDURE

- a. Remove all other equipment donned over the MSF300 before proceeding.
- b. Wash down the MSF300 while wearing it, paying particular attention to the entry and relief slide fasteners. Remove all traces of salt.
- c. Release the wrist adjustment Velcro.

CAUTION: Failure to completely open the waterproof entry zipper will result in damage to the suit when it is doffed.

- d. Completely loosen the neck seal drawstring and open the waterproof entry zipper.
- e. Insert fingers between the neck seal and neck. Gently stretch the seal outward and upward while pulling shoulders and head out of the suit.
- f. Cup the hand, fingertips and thumb together, and gently pull your hand from the seal. Repeat for other hand.
- g. Remove your legs from the suit.



- h. Hang the suit by the hanging loop, halfway close waterproof entry zipper and hang until dry.

6.0 PACKING

6.1 PACKING PROCEDURE

- a. Open the entry zipper and slacken the neck seal opening as much as possible.
- b. Lay out the MSF300 on a table, facing up (see figure 21).

Figure 21. Packing Step b.



- c. Fold the sleeves across the front.

Figure 22. Packing Step c.





d. Fold the legs up.

Figure 23. Packing Step d.



e. Fold over at the waist.

Figure 24. Packing Step e.





- f. Pick up the MSF300 by the zipper and place into the bag, with the zipper at the top.

Figure 25. Packing Step f.



7.0 MAINTENANCE AND CARE

7.1 GENERAL

- 7.1.1 After immersion in water (other than clean water), the suit modules should be either washed or rinsed separately. To increase the life of the garment, it is recommended to wash the suit only when required.

7.2 CLEANING

7.2.1 Separating the Layers

- a. Unzip the waterproof entry zipper.
- b. Reach in and pull the sleeves inside out.
- c. Unfasten the two interconnection buckles at each wrist.
- d. Unfasten the two interconnection buckles at each shoulder.
- e. Unzip the upper and lower waist interconnection zippers.
- f. Reach in and pull the legs inside out.
- g. Unfasten the two interconnection buckles at each ankle.

7.2.2 Outer Shell

Do not use bleach or other chlorine products.

Do not use fabric softeners.

Do not dry clean.

Do not use commercial laundry facilities.



Ensure all pockets are emptied and layers have been separated.

7.2.2.1 Mud and soil stains should be removed from the suit. Mud stains must be either allowed to dry and then removed with a cloth brush, or sponged clean with cold fresh water. Other stains should be sponged with cold fresh water. After cleaning, the suit should be thoroughly air-dried.

7.2.3 Machine Wash

7.2.3.1 Hand washing is recommended.

7.2.3.2 The suit can be machine washed only as follows:

- a. Ensure that the entry and relief zippers are closed.
- b. Ensure that only cold water is used with mild low sudsing powdered detergent.

CAUTION: Liquid detergents are not recommended.

- c. The wash cycle should not exceed three minutes in a gentle cycle.
- d. Rinse the suit three times, using clean, fresh water for each rinse.
- e. Each rinse cycle should be a minimum of one minute.

NOTE: Proper rinsing is essential to removing the entire soap residue. Any residue could inhibit the vapour permeability of the fabric.

- f. Hang the suit from a sturdy bar to air dry (approximately 4-6 hours), and turn the suit right side out after it is completely dry. The suit may require flipping and additional drying time to ensure both sides are completely dry.

7.2.4 Acid Stains

7.2.5 A suspected acid stain and any other part of the suit, which has been in contact with the suspected area, should be tested with litmus paper. If the result is positive, the affected area must be cut out. The areas immediately surrounding the affected area should be swabbed with a 50% solution of ammonia (specific gravity 0.88) and distilled water. When the fabric is dry, the hole must be patched. See section 7.4.8 for patching procedure and limits of repair.

7.2.6 Oil Stains

7.2.7 Oil stains can sometimes be removed by gently scrubbing in warm water with a soft brush and household detergent. After cleaning, the suit should be thoroughly air-dried.

7.2.8 A suit with slight oil stains should be tested to be waterproof. If the area has lost its waterproof qualities, the affected area should be cut away and patched. Severe oil stains will cause leakage of water and should be cut away and patched. See section 5.9.9 for patching procedure and limits of repair.

7.2.9 Other Damage

7.2.10 Singed, burnt or worn areas should be cut away and patched. See section 5.9.9 for patching procedure and limits of repair.

NOTE: Cut away material no more than 2 inches (50.8 mm) in diameter.

7.2.11 Treatment After Immersion

7.2.12 Whenever a suit has been immersed in water, it must be treated as specified below and then inspected in accordance with the current authorized servicing schedule.



7.2.13 Fresh Water Immersion

7.2.13.1 Allow the suit to dry naturally, preferably in the open air. If the insides of the socks are waterlogged, drying may be hastened by blowing with oil-free compressed air at room temperature.

7.2.14 Salt Water Immersion

7.2.14.1 Soak the suit in fresh water for thirty minutes and rinse thoroughly. Soak the suit for an additional thirty minutes and rinse again. Allow the suit to dry naturally, preferably in the open air.

7.2.15 Chlorinated Water Immersion

7.2.15.1 Immersion of the suit in chlorinated water is not recommended. If the suit is immersed in chlorinated water, use the same procedure as for salt water immediately following immersion.

7.2.16 Thermal Liner

- b. Wash by hand in warm water using a mild powdered soap.
- c. Rinse thoroughly in clean water.
- d. Hang to air-dry.

CAUTION: Ensure the Outer Shell and Thermal Liner are completely dry before reassembling.

7.3 DAMAGE TREATMENT

7.3.1 Singed, burnt or worn areas of the Thermal Liner should be cut away and patched. See section 7.4.8 for patching procedure and limits of repair.

NOTE: Cut away material no more than 2 inches (50.8 mm) in diameter.

7.3.2 Metal Zipper Care

7.3.3 Zipper cleaning is the first step to zipper longevity. Clean the zipper of any mud, sand, salt or foreign elements. Use warm soapy water to remove any heavy deposits.

7.3.3.1 For the metal entry and relief zippers, use one of the zipper manufacturers' recommended cleaning fluids listed in figure 26. Every few uses, apply a recommended wax for zipper lubrication. Use a recommended wax after cleaning for zipper lubrication. For example, a daily use suit requires wax once a week.

Figure 26. Recommended Zipper Cleaning Fluids and Waxes

CARE PRODUCT	PRODUCT NAME	SUPPLIER
Cleaning Fluid	Zippy Cool	YKK USA
	Zip Care	McNett
	BDM Fluid	BDM UK
Lubricating Wax	Zippy Cool	YKK USA
	Zip Wax	McNett
	BDM Wax	BDM UK

7.3.4 Storage

7.3.4.1 It is important that the MSF300 is stored in:

- a. A dry area, where normal room temperature may be maintained.



- b. An area without excessive sunlight, and ultra violet rays, and is free of petroleum products, acids and other damaging contaminants.

CAUTION: Never store the suit wet.

Never hang the suit from the neck seal; doing so may result in suit damage.

7.4 INSPECTION

7.4.1 General Suit Examination

- 7.4.2 Periodically examine your MSF300 for visual signs of abrasion or damage. Lay the suit modules on a clean, flat surface. Ensure the inside, and outside, of the suit is dry. Visually check for small rips, tears, or punctures, which may be repaired by a suitable repair station*. Major rips, tears, or punctures should be referred to Mustang for inspection and repair.

* Please contact Mustang Survival Corp. for more information.

NOTE: Proper care of this garment is extremely important for best results and extended service.

7.4.3 Service Life

- 7.4.3.1 The suit's service life is determined on condition rather than age. Suits may remain in service indefinitely if properly maintained and all tests and inspections are satisfactory.

7.4.4 Work Area

- 7.4.4.1 The work area where inspection and maintenance of the suit is performed should be smooth and flat, where the suit will not snag, tear or otherwise be punctured or damaged and should be cleared of all non-essential equipment and materials. The working surface should be free of harmful contaminants such as oil, grease, acids or solvents. Work areas, which are subjected to wide temperature variations, should be avoided.

7.4.5 Inspection Intervals

- 7.4.5.1 The suit should be inspected:
 - a. On receipt from the supply depot or contractor.
 - b. Periodic inspections; depending on the environmental conditions of usage, not to exceed 180 days unless in storage. Heavy use, may require more frequent inspect cycles.
 - c. Before and after use by the individual issued the suit.
 - d. Whenever the integrity of the suit is in doubt.

7.4.6 Visual Inspection

- 7.4.6.1 A close visual inspection should be performed prior to issue, by the issuer and the suit user.
- 7.4.6.2 To perform a close visual inspection, ensure:
 - a. There is no excessive wear or damage to the material, particularly stiffness, discoloration, burns, tears and frayed edges.
 - b. There is no separation of the seams, broken or missing stitches.



- c. All metal components are intact and free from damage or corrosion.
- d. The zippers are intact and operating smoothly.
- e. All adjustment straps are adjusting freely and smoothly.
- f. All pockets and pocket closures are intact.
- g. Neck, wrist seals and socks have not deteriorated: cuts, tears, detachment.

7.4.7 Periodic Inspection

- 7.4.7.1 The suit manufacturer, or a qualified Life Support Equipment Technician with the appropriate equipment, should carry out the in-depth periodic inspection (every 180 days). Heavy use, may require more frequent inspect cycles.

This inspection includes:

- a. Visual inspection
- b. Leak testing every second periodic inspection (unless damage is suspected)
- c. Zipper, or slide fastener inspection

7.4.8 Leak Testing

- 7.4.8.1 The following suit leakage test uses Mustang Survival Corp. Dry Suit Test Kit (MA8836). Your equipment may differ and, if so, the test should be adjusted accordingly. Mustang Survival Corp. offers an opportunity to purchase the Dry Suit Test Kit (MA8836) used in this test. Contact us for more information.

Figure 27. Suit Leakage Test Kit



- a. Ensure the Outer Shell has been separated from the Thermal Liner. Turn the Outer Shell inside out.



- b. Place the neck plug into the Outer Shell, through the main entry zipper. Close the main entry zipper by reaching in through the neck opening to pull the zipper toggle.

Figure 28. Step b. Suit Leakage Test



- c. Pull the narrower end of the neck plug through the opening of the neck seal.

Figure 29. Step c. Suit Leakage Test



- d. Stretch the neck seal to fit securely around the neck plug (the end with the smaller diameter).

Figure 30. Step d. Suit Leakage Test





- e. Fit the cinching strap over the neck seal.

Figure 31. Step e. Suit Leakage Test



- f. Secure the cinching strap by pulling up the excess strap, and fasten the Velcro closures.

Figure 32. Step f. Suit Leakage Test



- g. Clamp both wrist seals with the clamps provided.

Figure 33. Step g. Suit Leakage Test





- h. Connect the two coiled pneumatic hoses to the output side of the control box. The two hoses are interchangeable.

Figure 34. Step h. Suit Leakage Test



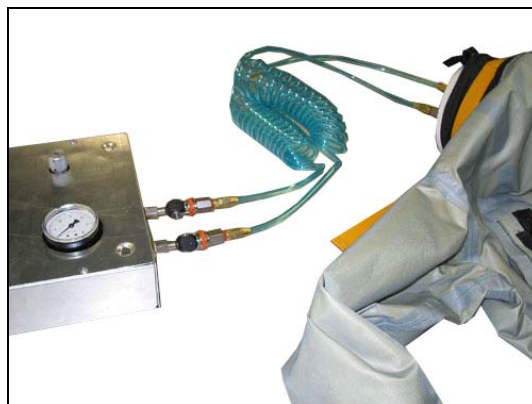
- i. Connect the other ends of the coiled hoses to the neck plug. It does not matter which hose connects to which plug. Figure 35 shows the correct configuration.

Figure 35. Step i. Suit Leakage Test



- j. Ensure your configuration matches figure 36, that shows the two coiled pneumatic hoses correctly attached to the control box and the neck plug.

Figure 36. Step j. Suit Leakage Test





- k. Connect high-pressure air source to the input side of the control box. The air pressure should be no greater than 150 psi.

NOTE: Ensure the control lever is set in the off position before the high-pressure air is connected.

Figure 37. Step k. Suit Leakage Test



- i. The control box has one pressure gauge and two controls. The black control lever has three positions as labeled on the control box. The knurled knob can be turned to restrict the airflow traveling into the dry suit.

Figure 38. Step I. Suit Leakage Test



- m. Move the control lever to the fast position. The suit should inflate rapidly. Once the suit appears $\frac{3}{4}$ inflated, move the lever to the slow position. Turn the knurled knob to restrict the airflow rate until the suit inflates up to 12 in. water pressure. Twist the knurled knob further to hold pressure inside the suit at 12 in. water.
- n. Spray the entire suit with a soap and water solution of 0.5% soap to water by weight. Pay particular attention to the seams and zippers.

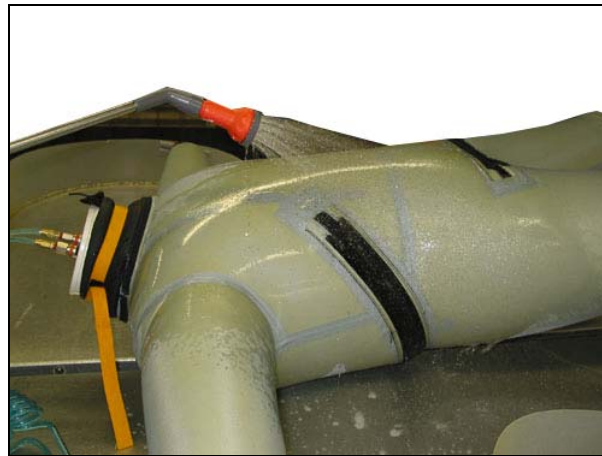
Examine any area of the suit where bubbles are forming and take action depending on the severity as follows (note that bubbles forming at a rate of less than one per second are probably not leaks):

- i. Small foamy bubbles collecting slowly on seam: Entrapped air. No leak present, no action required.



- ii. Small foamy bubbles collecting quickly on seam: Uncertain. Agitate seam around bubbles to remove any entrapped air. If bubbles persist after 10 minutes then consider as leak, mark leak area with a china marker, and document on the inspection record.
- iii. Steady stream of larger bubbles: Leak. Mark leak area and document on the inspection record.
- iv. Any other type of bubble formation or any sign of bubbles on a panel shall be treated as a leak.

Figure 39. Step n. Suit Leakage Test



- o. When the test is completed, move the control lever to the off position. Remove the clamps from the suit and disassemble the rest of the test kit. Hang the suit to dry.

7.5 REPAIRS

7.5.1 General

7.5.1.1 The protection provided by this dry suit relies very much on its watertight characteristics. It is extremely important that damaged suits are handled in accordance with the following repair requirements.

7.5.1.2 Qualified repair personnel can normally perform minor repairs, with adequate facilities. The manufacturer should do all major repairs. This section provides some information to assist with minor or emergency repairs to the suit and related components.

NOTE: Stitching shall not be used for repair of tears or holes.

7.5.1.3 The proper work area is identified in section 7.4.4 of this document.

7.5.1.4 Before any items are glued to the suit, the attachment areas must be thoroughly cleaned. Fabric surfaces may be cleaned with a stiff brush (not wire). Brushing must be done lightly or the properties of the fabric will be destroyed.

7.5.2 Inspection Failures

7.5.2.1 These are the recommended repairs for any suit failing inspection:

- a. Missing, damaged or corroded parts of components shall be replaced



- b. Heavily soiled areas shall be cleaned using only mild soap and water with a soft, non-abrasive nylon or synthetic bristle brush. Other cleaning agents or solvents must not be used.
- c. Worn, broken or missing stitching should be repaired
- d. Any additional parts or components found to be defective should be repaired or replaced

7.5.3 **Stitching**

7.5.3.1 All repairs involving sewing shall be done with thread that corresponds to the colour of the material being sewn.

7.5.3.2 Seam repairs, stitching, and joining shall be done using a single needle lockstitch, eight to ten stitches per inch. Securely backstitch all ends of stitching not less than $\frac{1}{2}$ inch (12.5 mm). The seam allowance to be used is $\frac{3}{8}$ inch (9 mm) $\pm \frac{1}{16}$ inch (2mm). Securely backstitch breaks in thread not less than 1 inch (25 mm).

7.5.4 All stitching for the waterproof module should be done with Nomex[®] aramid thread. The Thermal liner black nylon thread and be a single needle lockstitch. Stitching density should be eight to ten stitches per inch and all broken threads, seam ends and ends of stitching should be backstitched not less than $\frac{1}{2}$ inch (12.5 mm). Most of the seam allowances are $\frac{1}{2}$ inch (12.5 mm).

7.5.5 **Leak Repairs**

7.5.5.1 Locate the leak, and assess the reparability of the leak. Use the following Limits of Repair section to make the assessment. In cases of significant damage, the manufacturer should repair the damage.

7.5.6 **Limits of Repair**

7.5.6.1 It is recommended that the following guidelines be used in determining potential for repair. A qualified technician should make all repairs.

- a. Patches on the sleeves or legs should not exceed 16 inches² (103 cm²) or 4 inches by 4 inches. Patches on the front or back of the suit should not exceed 36 inches² (232 cm²), and the total area of patches should not exceed 10% of the suit. Repair no more than 10% of any one panel.
- b. Any repairs beyond 16 inches² should be made by cutting out the damaged area and sewing new three-layered GORE[™] material using the same method as installing socks to the suit (see section 7.6).
- c. Slits and tears no longer than three inches (76 mm). Slits, cuts, tears and large holes may be patched with fabric by gluing (see section 7.5.9).
- d. Patching pinholes by the heat-sealing method (see section 7.5.10).
- e. Replace defective slide fasteners (see section 7.5.13).
- f. Do not patch the neck or wrist seals or socks.

7.5.6.2 All minor repairs should be performed using the following sections.



7.5.7 Repair Materials

7.5.7.1 The full description and part numbers of the materials required for repairs are detailed in section 9.0 of this manual. Additionally, some small repair materials are included with the suit.

7.5.8 Gluing

7.5.8.1 Gluing should only be performed in a clean, dry, well-ventilated area. Repair personnel should wear protective rubber gloves and follow the adhesive supplier's guidelines for use and preparation. All surfaces must be clean and dry prior to gluing. Mustang PN GL1001 (Bostick 1125A) adhesive glue, with curative, is recommended for repairs.

7.5.8.2 To glue a section of the suit:

- a. Apply three coats of the adhesive over the full contact area using a small brush, ensuring that the glue does not adhere to the inner face of the fabric.
- b. Apply the first coat and allow drying until tacky.
- c. Apply the second coat and allow drying until tacky again.
- d. Apply the third coat of adhesive and allow drying until tacky.
- e. Join the surfaces carefully by pressing together with the gloved fingers of both hands.
- f. Always leak test the suit after completion of repairs, after a minimum of twenty-four hours of drying, to ensure the repairs are watertight. Do not use the suit if the repairs are not successful.
- g. The repair area must be allowed to dry for a minimum of 24 hours prior to wearing or re-issuing the suit.

7.5.9 Patching

7.5.9.1 All patching of **minor** tears and holes should conform to the following:

- a. Apply the fabric patch to the outside of the suit and ensure that the weave corresponds to that of the material surrounding the repair area.
- b. The repair patches, made from the three-layered GORE™ material, must extend by not less than one inch beyond the perimeter of the damage (see figure 27); i.e. if the diameter of the **jagged tear** is one inch (25 mm), the patch should be three inches (75 mm) in diameter. If a **straight tear** is 1 1/2 inches (38 mm) long, the patch should be 3 1/2 inches (89 mm) by two inches. **L-shaped tears** should be treated as round holes, where the distance between the ends of the tear is the "diameter".



Figure 40. Simulated Tears and Suggested Patch Configurations (Not to Scale)

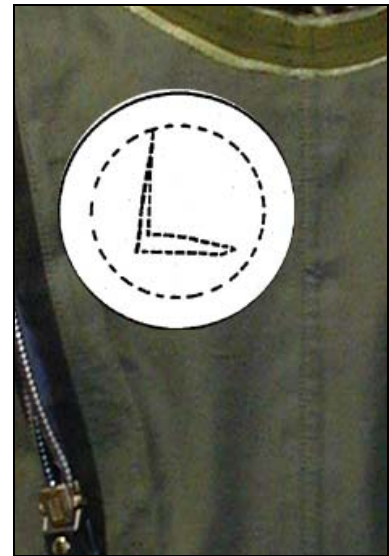
Jagged Tear Patch



Straight Tear Patch



L-Shaped Tear Patch



- c. Patches should be circular or rectangular, with rounded corners.
- d. Repair closely grouped small holes or tears with one large patch, rather than several small ones. Patches must **not** overlap one another.
- e. If the damage extends across a seam, the patch shall also extend across the seam but shall not be incorporated into the seam by stitching.
- f. Follow the gluing procedures outlined in section 7.5.8.
- g. Attach the patch to the outside of the suit.
- h. Roll firmly (with a suitable roller) to remove all entrapped air, channels and wrinkles to achieve an adequate bond.
- i. Sprinkle French chalk or Talcum powder on the exposed adhesive and allow the adhesive to dry.
- j. Always leak test the suit after completion of repairs, and after a minimum of twenty-four hours of drying, to ensure the repairs are watertight.

7.5.10 Patching by Heat Sealing

7.5.10.1 Patching by heat sealing is appropriate to repair damaged sealing tape no more than one inch in length. Patches for heat sealing may be obtained from Mustang Survival. To apply a patch (two inch diameter), or seam tape (see section 9.0) proceed as follows:

NOTE: Ensure that the suit has been thoroughly dried prior to patching. Round off the corners of the heat tape prior to application. Ensure the patch/heat tape is applied on the inner surface of the suit fabric. A household iron and an ironing board or pad are required.



- a. Turn iron on at medium setting and wait for ten minutes to allow the iron surface temperature to stabilize at 284°F (140°C).

NOTE: Use an iron that accurately displays temperature to avoid damage to the fabric.

If possible, test the temperatures setting by ironing a patch or a piece of heat tape on the inner side of a piece of suit fabric for 25 seconds. If the patch of tape is properly adhered to the fabric, without burning, the temperature setting is acceptable.

- b. Centre the area to be patched on the ironing board or a pad, ensuring that only one layer of fabric is on the pad or board and that there are no wrinkles in the fabric. The inner side of the fabric should be facing up.
- c. Centre the patch or heat tape side down on the inner side of the suit fabric, covering the damaged area.
- d. Iron the patch or heat tape for approximately twenty-five seconds and remove the iron.

NOTE: Patches may be overlapped and shall extend at least $\frac{1}{2}$ inch (12 mm) beyond the damaged area.

- e. Smooth out wrinkles and air pockets by moving iron along the patch.
- f. Allow the repaired area to stand for a minimum of one hour prior to further handling.
- g. Test the suit for leakage.

7.5.11 Taping

7.5.11.1 If a portion of a suit seam requires re-taping, then follow the procedures outlined below. Refer to section 9.0 for details of the adhesive and seam tape required for these repairs. To re-tape a seam:

- a. Cut the seam tape to the required length, allowing a one-inch (25 mm) overlap on the fabric side of the tape.
- b. Round the corners of the new tape to prevent peeling.
- c. Remove the existing seam tape to the best of your ability.
- d. Create a smooth surface with toluene.
- e. Apply three coats of adhesive to the suit (see section 7.5.8).

NOTE: The surfaces of the tape don't need to be prepared with adhesive when the suit's surface has already been properly prepared.

- f. Peel off the backing from the seam tape before applying to the surface of the joint.
- g. Apply the seam tape to the repair area when the final coat is tacky.
- h. Firmly roll the glued areas with a suitable roller to remove entrapped air, channels, and wrinkles.



- i. Always leak test the suit after completion of repairs, and after a minimum of twenty-four hours of drying, to ensure the repairs are watertight.

NOTE: Stitching shall not be used for repair of tears or holes, other than for the Thermal Liner.

7.5.11.2 The proper work area is defined in section 7.4.4 of this document.

7.5.12 Repair Materials

7.5.12.1 The full description and part numbers of the materials required for repairs are detailed in section 9.0 of this manual.

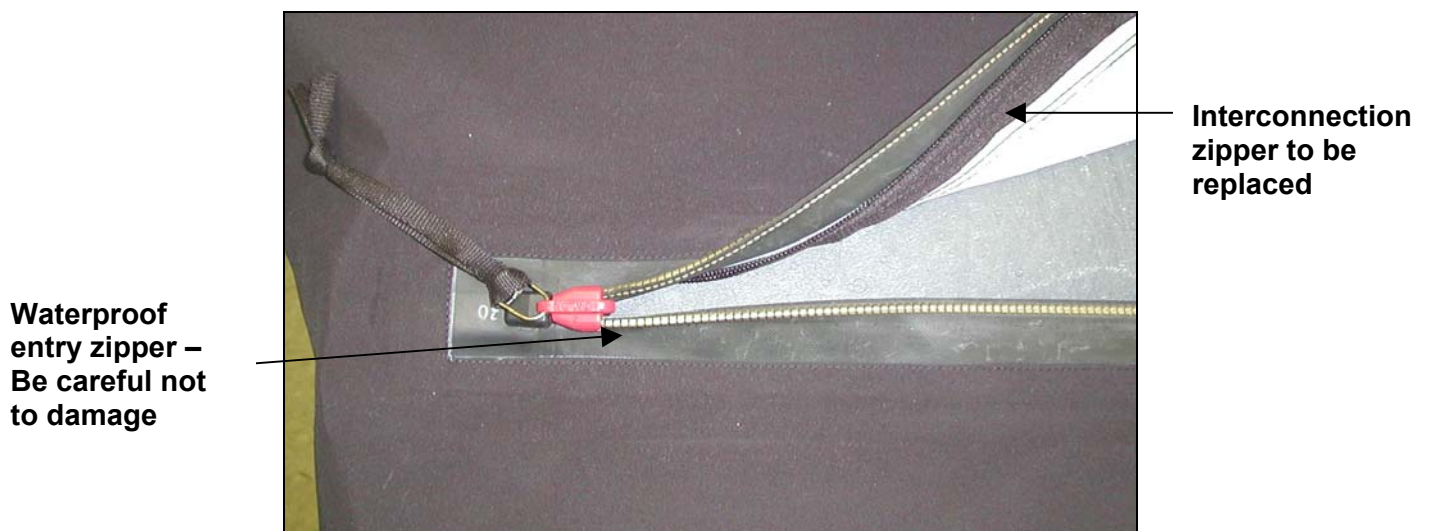
7.5.13 Interconnection Zipper Replacement

NOTE: Only interconnection zippers may be replaced. Do not attempt to replace the waterproof zippers on the Outer Shell.

7.5.13.1 Replace the interconnection zippers as follows:

- a. Identify the interconnection zipper to be replaced. Use the list of parts in section 9.0.

Figure 41. Step a. Interconnection Zipper Replacement





- b. Cut the stitching around the zipper (see figure 42); ensuring the beginning of the stitching is broken.

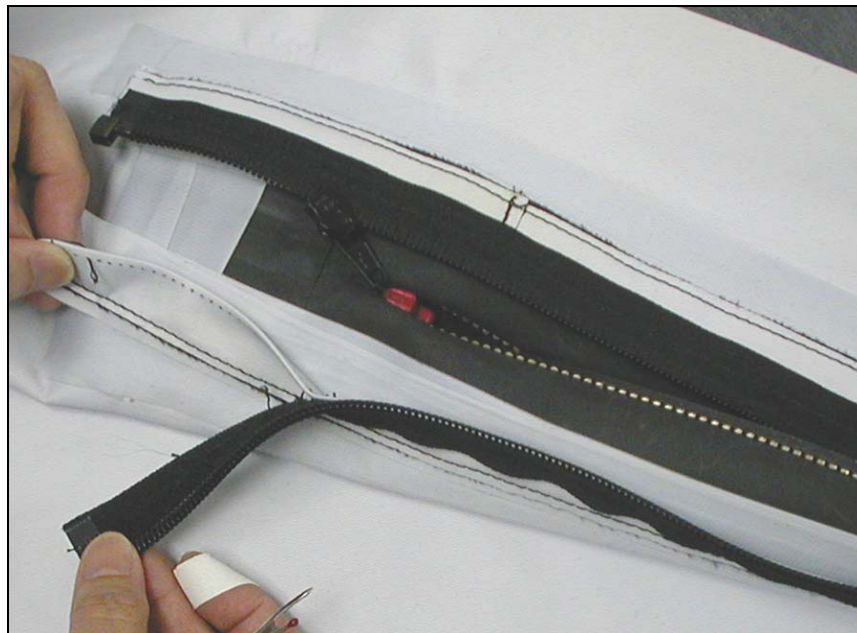
NOTE: *Be careful not damage the Outer Shell.*

Figure 42. Step b. Interconnection Zipper Replacement



- c. Remove the broken zipper by gently pulling it away.

Figure 43. Step c. Interconnection Zipper Replacement





- d. Align the edge of the fabric closely to the edge of the replacement zipper tape and sew $\frac{1}{8}$ inch from the edge, until completely attached.

Figure 44. Step d. Interconnection Zipper Replacement



7.6 FITTING OF WATERPROOF IMMERSION SOCKS

- 7.6.1 The following instructions must be followed when attaching the socks to the MSF300 Tactical Aircrew Dry Suit System.
- 7.6.2 Fit the socks, constructed of watertight vapour permeable fabric, to the MSF300 Tactical Aircrew Dry Suit System as follows:
 - a. Ensure the sock opening has the correct circumference, in relation to the suit leg opening, and turn the legs of the MSF300 Tactical Aircrew Dry Suit System inside out.

NOTE: Due to slight differences in circumference of suit leg and sock opening, it is recommended that alignment marks be added to both items before sewing.

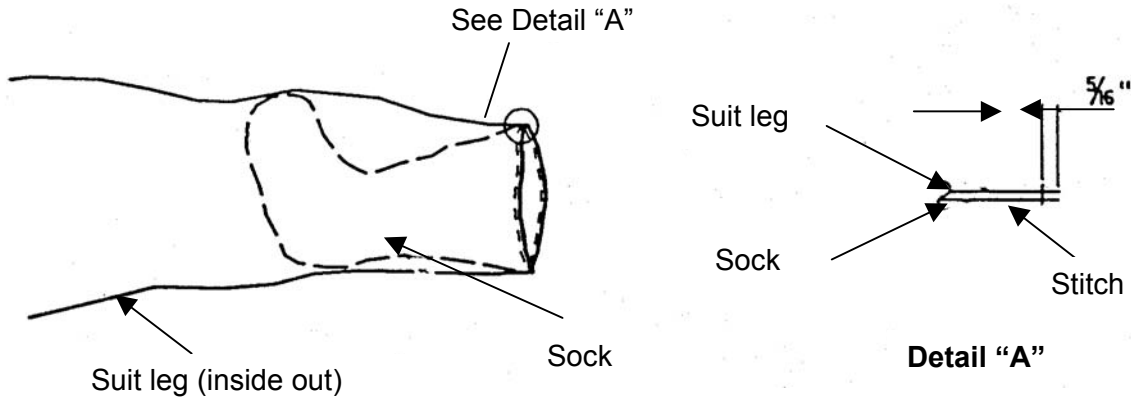
Make marks at the front, back, and both sides, equally spaced around the circumference of both openings.

It may be necessary to manually induce an uneven feeding of materials into the sewing machine in order to compensate for differences in sock and suit leg circumferences, minimizing pleats or puckers.



- b. Ensure the suit is positioned with its back portion laying on the working surface. Insert the sock into the leg opening with the toe section pointing upwards (see figure 45).

Figure 45. Steps a. and b. Fitting of Immersion Socks

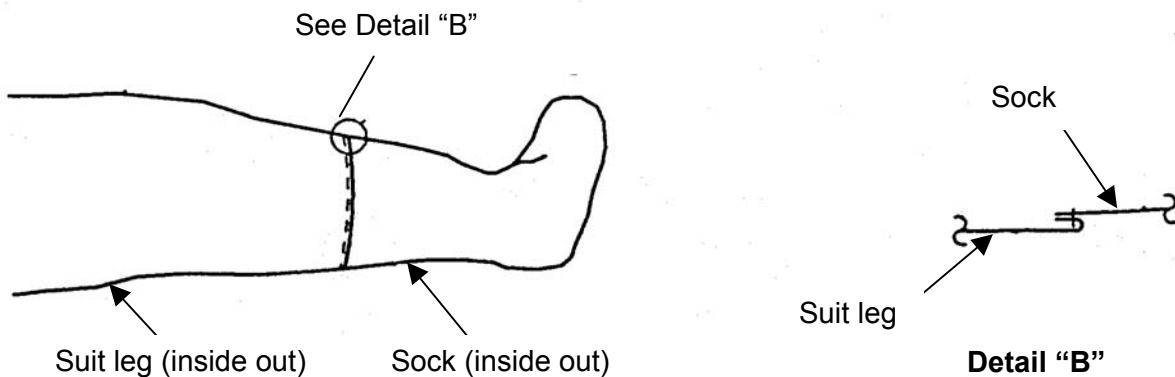


- c. With the leg and sock alignment marks matched and the edges of the opening aligned, attach the sock with one row of stitches $\frac{5}{16}$ inch (8 mm) from the edges using a single needle lockstitch, eight to ten stitches per inch. Securely backstitch the end of the stitching not less than $\frac{1}{2}$ inch (12 mm).

NOTE: The thread used should conform to the Commercial Item Description A-A-50195. Match the thread colour to the suit colour.

- d. Pull the sock inside out (see figure 46) and ensure the sock and leg cut edges are pointing towards the upper part of the suit (see detail "B" of figure 46).

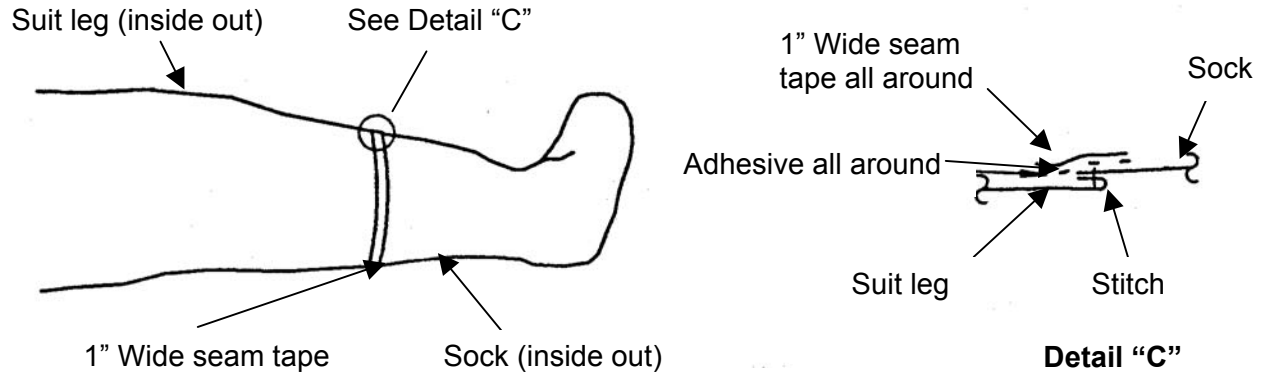
Figure 46. Steps c and d. Fitting of Immersion Socks





- e. Tape the joint (see section 7.5.11).

Figure 47. Step e. Fitting of Immersion Socks



8.0 SUMMARY

The Mustang Survival Tactical Dry Suit System Model MSF300 is a constant wear dry suit that protects from the hazards of flight, flame, immersion, and hypothermia and reduces heat stress. The MSF300 is designed for crewmembers in over-water helicopter operations, with cold-water immersion features and flotation. The suit is easily donned, maintained and stored. Qualified approved technicians, with proper equipment, or Mustang Survival Corp. may make suit repairs. A well-maintained suit means survival in emergencies for which normal clothes were not designed.



9.0 PARTS LIST

These materials are highly recommended for repairs and replacements. Item order quantity is based on their availability. Qualified repair personnel can perform some repairs, with adequate facilities. The manufacturer should do all major repairs, unless otherwise authorized by Mustang Survival Corp.

Figure 48. MSF300 Outer Shell (Part Number MA7345) and Index Numbers





Figure 49. Parts List for the MSF300 Outer Shell MA7345 (see figure 48)

INDEX NUMBER	PART NUMBER	NOMENCLATURE
1	FA-150013	EXOSKIN SPORT, BLACK
2	HD-756813	TOASTER ELLIPSE BLACK CORDLOC
3	VE-900013	3/4 IN. (19 MM) BLACK HOOK FASTENER
4	TA-108113	5/16 IN. (8 MM) WIDTH RIBBON TAPE
5	HD-718530	SNAP FASTENER EYELET, MILITARY BLACK, PULL-THE-DOT
6	HD-7770	DOME CAP
7	HD-7780	STUD
8	HD-7785	SOCKET
9	HD-7580	BRASS DULL BLACK CHEMICAL GROMMETS PARAFFIN & BRASS DULL BLK CHEM WASHERS
10	FA-107313	3-LAYER BD 6.5, BLACK, NYLON
11	FA-116927	3-LAYER LAMINATED NOMEX 4.5 OZ SAGE GREEN
12	FA-112127	NOMEX 4.3 OZ. SAGE GREEN
13	LC-10237	OLIVE GREEN FILLER CORD LACE ON ROLLS, SPUN POLYESTER
14	VE-91827	2 IN. (51 MM) SWAMP GREEN HOOK FASTENER (FIRE RETARDENT)
15	VE-91837	2 IN. (51 MM) SWAMP GREEN LOOP FASTENER (FIRE RETARDENT)
16	FD-230613	GLIDESKIN ON FAIRSKIN, BLACK
17	TA-105413	3/4 IN. (19 MM) BLACK MELCO TAPE
18	VE-910013	1 IN. (25 MM) BLACK HOOK FASTENER
19	VE-911013	1 IN. (25 MM) BLACK LOOP FASTENER
20	TA-102713	1 IN. (25 MM) GROS GRAIN RIBBON TAPE, BLACK
	TA-105513	3/4 IN. (19 MM) SOFT GROS GRAIN RIBBON, BLACK, NYLON (CONNECTION BUCKLE TAPE)
	TH-860713	POLYESTER BLACK SERGING THREAD
	TH-885013	BLACK ANEFIL TEX-30
	TH-886027	BONDED NOMEX THREAD SAGE GREEN
	TH-886613	BONDED NYLON THREAD - BLACK
	VE-93107	2 IN. (51 MM) SWAMP GREEN LOOP FASTENER
	WE-800013	1 IN. (25 MM) BLACK POLYPROPYLENE



	TA-108514	1 IN. (25 MM) 3-LAYER 6 DK.SILVER SEALING TAPE (SOCK CONNECTION)
	TA-1045	1 IN. (25 MM) NOMEX SEAM TAPE (SEALING TAPE)

Figure 50. Zipper List for the MSF300 Outer Shell MA7345 (see figure 48)

INDEX NUMBER	SUIT SIZE	PART NUMBER	NOMENCLATURE	MIN ORDER QUANTITY
Z1	S	ZI-3110	6 IN. (152MM) ZIPPER Fly	10 EA
	M	ZI-3110	“	10 EA
	L	ZI-3110	“	10 EA
	XL	ZI-3110	“	10 EA
	XXL	ZI-3110	“	10 EA
Z2	S	ZI-719927	6 IN. (152MM) ZIPPER Sleeve	10 EA
	M	ZI-719927	“	10 EA
	L	ZI-719927	“	10 EA
	XL	ZI-719927	“	10 EA
	XXL	ZI-719927	“	10 EA
Z3	S	ZI-720327	7 IN. (178MM) ZIPPER	10 EA
	M	ZI-720327	“	10 EA
	L	ZI-720327	“	10 EA
	XL	ZI-720327	“	10 EA
	XXL	ZI-720327	“	10 EA
Z4	S	ZI-9160LH	33.5 IN. (851 MM) LEFT HALF OF ZIPPER (COIL PIN)	10 EA
	M	ZI-9160LH	“	10 EA
	L	ZI-9401LH	41.5 IN. (1054 MM) LEFT HALF OF ZIPPER (COIL PIN)	10 EA
	XL	ZI-9401LH	“	10 EA
	XXL	ZI-9161LH	49.5 IN. (1257 MM) LEFT HALF OF ZIPPER (COIL PIN)	10 EA
Z5	S	ZI-9007	35.5 IN. (902 MM) MAIN ENTRY ZIPPER	10 EA
	M	ZI-9007	“	10 EA
	L	ZI-9005	43.5 IN. (1105 MM) MAIN ENTRY ZIPPER	10 EA
	XL	ZI-9005	“	10 EA
	XXL	ZI-9008	51.5 IN. (1308 MM) MAIN ENTRY ZIPPER	10 EA



Figure 51. MSF300 Thermal Liner MA7246 and Index Numbers



Figure 52. Parts List for the MSF300 Thermal Liner MA7246 (see figure 51)

INDEX NUMBER	PART NUMBER	NOMENCLATURE
1	FA-125113	DRAINAGE MESH, BLACK, 100% POLYESTER
2	FA-124213	100% NYLON MESH, BLACK
3	TA-102927	3/4 IN. (19 MM) GROS GRAIN RIBBON TAPE SAGE GREEN
4	TA-105513	3/4 IN. (19 MM) SOFT GROS GRAIN RIBBON, BLACK, NYLON
5	TA-103113	1 5/8 IN. (41 MM) WIDTH POWER NETTING STRAIGHT CUT, BLACK
6	HD-7178F	3/4 IN. (19 MM) ACETAL BAND BUCKLE, FEMALE ONLY
	FD-300210	AIRSOFT PERFORATED WITH HOLES



	TH-850513	DUAL DUTY TEX 60 BLACK
	TH-860713	100% POLYESTER BLACK SERGING THREAD
	TH-885013	ANEFIL TEX-30, BLACK
	TH-886613	BONDED NYLON THREAD - BLACK

Figure 53. Zipper List for the MSF300 Thermal Liner MA7246 (see figure 51)

INDEX NUMBER	SUIT SIZE	PART NUMBER	NOMENCLATURE	MIN ORDER QUANTITY
Z1	S	ZI-9160RH	33.5 IN. (851 MM) RIGHT HALF OF ZIPPER (COIL PIN)	10 EA
	M	ZI-9160RH	"	10 EA
	L	ZI-9401RH	41.5 IN. (1054 MM) RIGHT HALF OF ZIPPER (COIL PIN)	10 EA
	XL	ZI-9401RH	"	10 EA
	XXL	ZI-9161RH	49.5 IN. (1257 MM) RIGHT HALF OF ZIPPER (COIL PIN)	10 EA

Figure 54. Expendables List for the MSF300

INDEX NUMBER	PART NUMBER	NOMENCLATURE	MIN ORDER QUANTITY
1	GL1001	BOSTIK 1125A ADHESIVE GLUE	1 CAN (5.28 galls US)
2	MI5008	AQUASEAL FORMULA ZIPCARE	24 EA
	MA7025	REPAIR PATCH KIT	1