
ORGANIZATIONAL MAINTENANCE

REPAIR PROCEDURES

MK-GRU7/MK-GRU7A/MK-GRUEA7 DROGUE PARACHUTE SYSTEM

List of Effective Work Package Pages

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Reference Material

None

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Record of Applicable Technical Directives

None

1. INTRODUCTION.

2. This work package (WP) contains instructions for organizational level repair to ensure that the escape system remains in ready-for-issue (RFI) status.

3. When performing repairs detailed in this WP, follow these guidelines:

a. Review all applicable instructions prior to starting repair.

b. Ensure that all necessary support equipment and materials required are available prior to starting repair.

c. When required remove enough material from it's source for immediate use only. Ensure that the material identification ticket remains with the source material at all times. Material that cannot be identified will not be used.

d. To ensure conformity, all repair work shall be carefully inspected and compared to applicable instructions at completion of work.

e. A quality assurance (QA) inspector shall examine the finished work.

4. CONTAINER ASSEMBLY.

5. FLAP SECURING PIN RETENTION TIE REPLACEMENT.

Materials Required

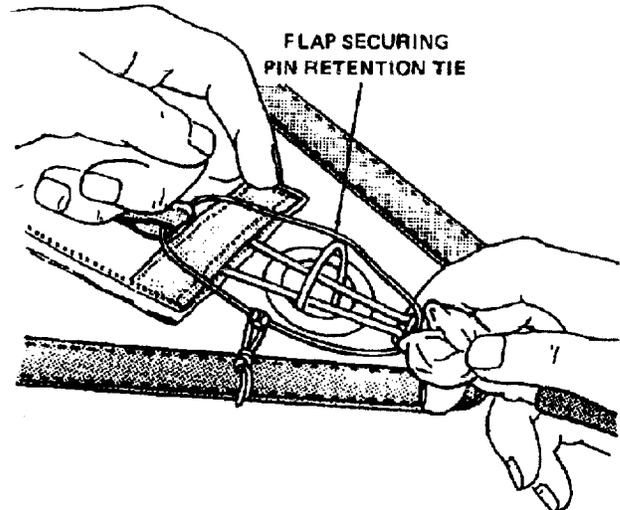
Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon Size 6, Type I or II, Class A

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Ensure pin is inserted into fabric pocket on front flap (Figure 1).

b. Pass a length of size 6 thread, single and waxed, thru flap securing pin and then thru fabric loop on pocket; tie off. Trim excess (Figure 1).



6.2-5660

Figure 1. Replacement of Flap Securing Pin Retention Tie

6. DROGUE SHACKLE RETENTION TIE REPLACEMENT.

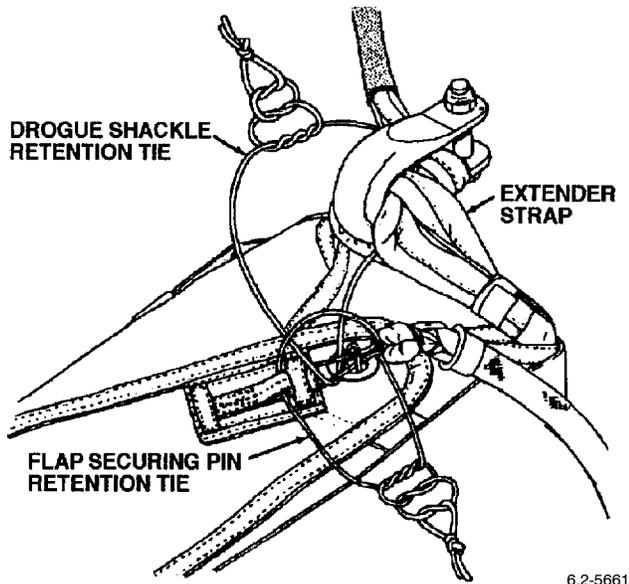
Materials Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Retention-tie drogue shackle with one turn of size 6 thread, waxed and single, routed thru loop of extender strap, thru shackle, and around both legs of securing pin forward of wire loop; tie off. Trim excess (Figure 2). (QA)



6.2-5661

Figure 2. Replacement of Drogue Shackle Retention Tie

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INTERMEDIATE AND DEPOT MAINTENANCE

PACKING PROCEDURES

MK-GRU7/MK-GRU7A/MK-GRUEA7 DROGUE PARACHUTE SYSTEM

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Reference Material

Introduction, Organizational, Intermediate and Depot Maintenance With Illustrated Parts Breakdowns, Emergency Personnel and Drogue Parachute Systems	WP 002 00
Organizational, Intermediate and Depot Maintenance, Parachute Loft Requirements/Administration	WP 003 00
Organizational, Intermediate and Depot Maintenance, Support Equipment	WP 005 00

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Record of Applicable Technical Directives

None

1. GENERAL.

a. Rigging and packing instructions are provided with the assumption that they will be carried out under ideal conditions in a parachute loft (WP 003 00). When a drogue parachute assembly must be packed under unfavorable conditions, provisions must be made to protect it from possible damage and excessive humidity.

b. In no case shall the packing of a drogue parachute assembly be interrupted after the packing operation has been started. If the packing operation is interrupted, due to unforeseen circumstances, the drogue parachute assembly shall be completely repacked per instructions contained in this Work Package (WP).

c. Quality Assurance (QA) points have been included in the rigging and packing procedures. When a procedural step is followed by “(QA)”, there is a quality assurance requirement. Witnessing of QA steps may be delayed by QA if their satisfactory completion is verified in later steps.

d. During rigging and packing procedures, packer shall be positioned on left side of packing table, and helper on right side when viewed from riser end of table.

2. PRELIMINARY PROCEDURES.

Support Equipment Required

Part Number	Nomenclature
—	Stamp Pad
—	-or-
—	Rubber Stamp Kit
—	-or-
—	Adjustable Metal Stencil
—	-or-
Style No. 8	Printing Set
—	-or-
GG-P-655	Printing Set
128GT10156	Packing Fixture

Materials Required

Specification or Part Number	Nomenclature
MIL-I-6903	Ink, Marking, Light Blue

Specification or Part Number	Nomenclature
TT-I-1795	Ink, Marking, Black
V-T-295	Thread, Nylon, Size FF, Type I or II, Class A
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A
MIL-I-19166	Insulation Tape, Electrical 3/4-in. Wide

a. To prepare the drogue parachute for rigging and packing, perform the following:

- (1) Ensure that all support equipment and materials required are available prior to starting.
- (2) Inspect packing tools for nicks, burrs, or sharp edges which may cause damage to the parachute.
- (3) Count and record number of packing tools.
- (4) Clean packing table.

3. LAYOUT OF DROGUE PARACHUTE ASSEMBLY.

a. Lay out drogue parachute on packing table (Figure 1).

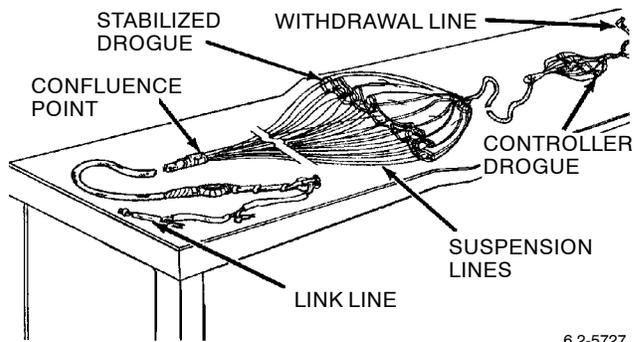


Figure 1. Layout of Drogue Parachute Assembly

4. INSPECTION (SPECIAL).

a. Maximum scheduled repack cycle is 448 days for the F-14A/B Aircraft.

b. Maximum scheduled repack cycle is 364 days for the EA-6B Aircraft.

5. SERVICE LIFE CHECK AND CONFIGURATION UPDATING.

NOTE

Unless otherwise noted, parachute component life shall start on the month of the date of manufacture and expire on the last day of that month.

a. All internal service life components, including cartridges, shall be replaced if service life expires prior to the next repack cycle. Repack cycles may be shortened to correspond to the first component that is expiring prior to the next inspection cycle. An external overage component (i.e. Parachute Harness Sensing Release Unit Cartridge) can be replaced without a parachute repack.

NOTE

Upon initiation of any Quality Deficiency Report (QDR), contact the In-Service Support Team at NAWCWD, China Lake, CA.

b. When replacing an external overage component without a parachute repack, draw a single red line through any information pertaining to that component on the Parachute Record (OPNAV 4790/101). The replacement component will be annotated on the next available line. The QA who witnessed the task shall apply the QA stamp to the right of the entry and complete the VIDS/MAF (OPNAV 4790/60).

c. A parachute assembly may be opened to permit compliance with a Technical Directive. After completion of directive, the parachute assembly repack cycle may be rebased if all parachute components have the necessary life available or may be returned with the original repack date in order to keep it aligned with the actual aircraft inspection cycle.

d. When a component reaches the service/total life limit, it shall be returned to supply for disposition.

e. If parts received from supply are lacking a date of manufacture and are new in manufacturer's packaging, they may be used for one complete repack cycle, then removed. Place "No Date of Manufacture" in the Date of Manufacture's block on the Parachute Record (OPNAV 4790/101). Submission of a Quality Deficiency Report (QDR) shall follow each occurrence.

f. Components without a service/total life shall be removed from service if the components do not pass inspection, as determined by Quality Assurance Representative (QAR) or Collateral Duty Inspector (CDI).

g. Check date placed in-service and date of manufacture on each parachute part for service/total life as follows:

Nomenclature	Service Life (Yr)	Total Life (Yr)
5-ft. Stabilizer Drogue	None	10
22-in. Controller Drogue	None	10
Connecting Line	None	10
Extender Strap	None	13
Link Line	2	10
Withdrawal Line	2	10

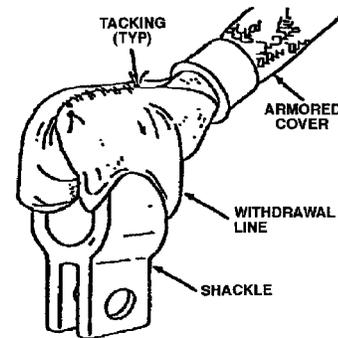
(1) Markings for completeness, legibility, and agreement with information on Parachute Record (OPNAV 4790/101).

(2) Compare configuration of parachute assembly to that shown in NAVAIR 13-1-6.2 Record of Applicable Technical Directives, and Illustrated Parts Breakdown.

6. CONTROLLER DROGUE.

a. Withdrawal Line shackle for nicks, burrs, dirt, and corrosion, proper attachment of shackle to withdrawal line, and security of tackings. (QA)

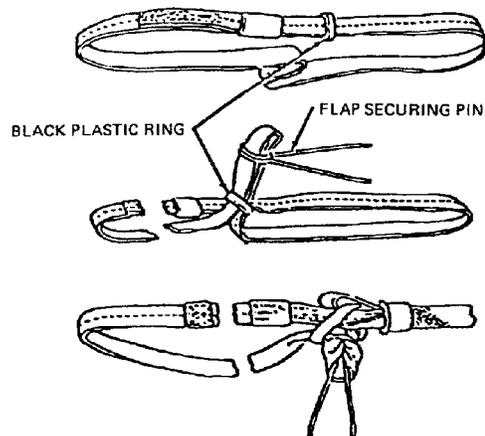
b. Armored cover for broken strands, security of end ferrules, and presence of dirt and corrosion (Figure 2).



6.2-1122

Figure 2. Controller Drogue Inspection

c. Flap securing pin for nicks, burrs, dirt, corrosion, bends, and proper attachment of the withdrawal line (Figure 3).



6.2-1123

Figure 3. Proper Attachment of Withdrawal Line

d. Ensure that all apex suspension lines and anti-squid line are encircled by withdrawal line with a Lark's head knot and tacking is properly attached and secured (Figure 4). (QA)

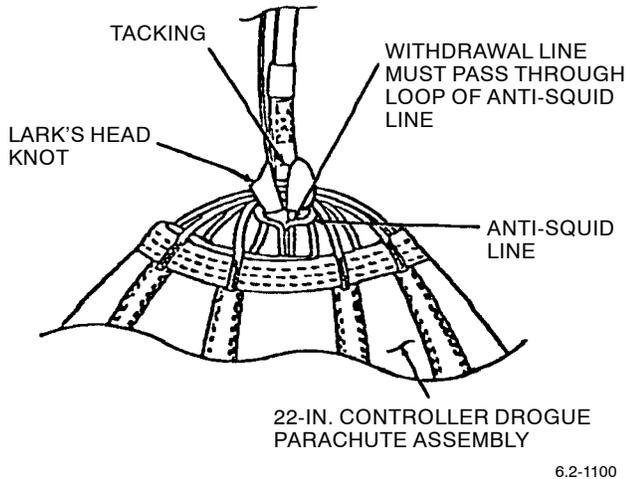


Figure 4. Proper Attachment of Lark's Head Knot

e. Withdrawal line for contamination, cuts, fraying, burns, loose or broken stitching, proper attachment of drogue parachute.

f. Fabric drag surface, seams, and suspension lines at canopy apex for contamination, mildew, cuts, tears, burns, fraying, and loose or broken stitches.

g. Anti-squid line for contamination, cuts, fraying, burns, loose or broken stitching, and security of attachment at canopy apex and terminal eye. (QA)

h. Suspension lines for the following:

(1) Lines from canopy skirt hem to terminal eye for frays, ruptures, dirt, lumps, and hard or thin spots.

(2) Protruding inner core lines for presence of twists in individual lines.

(3) Security of attachment at the skirt hem.

(4) Condition of V-tabs at the skirt hem.

(5) Security and condition of wrapping at terminal eye.

i. Drogue connecting line for contamination, cuts, fraying, burns, loose or broken stitching, and attachment of connecting line to 22-in. drogue parachute eye (Figure 5). (QA)

7. STABILIZER DROGUE.

a. Ensure that all apex suspension lines on 5 ft. drogue parachute are encircled by a Lark's head knot formed by connecting line. (QA)

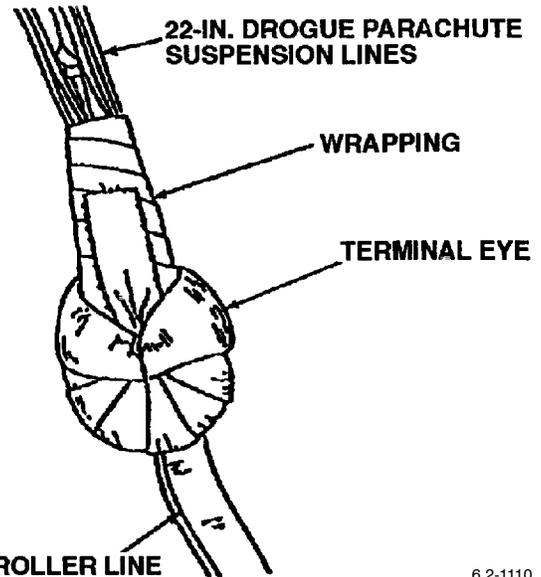


Figure 5. Drogue Connecting Line

b. Check tacking at apex (Figure 6).

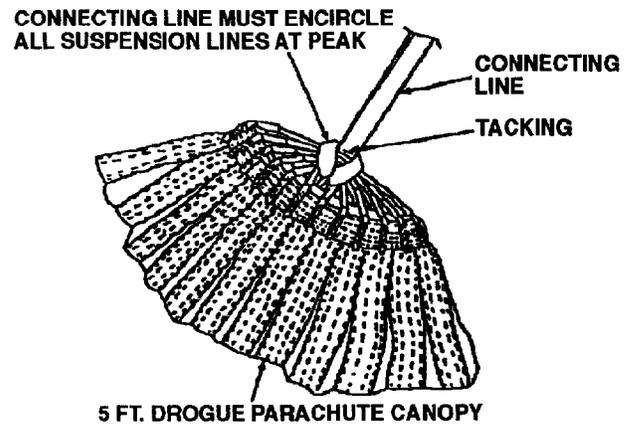


Figure 6. Tacking at Apex

c. Fabric drag surface, seams, and suspension lines for contamination, mildew, cuts, tears, burns, fraying, and loose or broken stitches.

d. Anti-squid line for proper attachment at canopy apex (Figure 7). (QA)

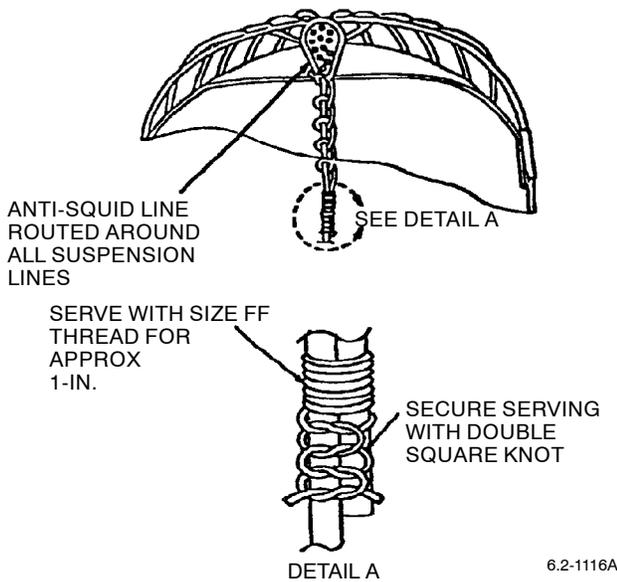


Figure 7. Anti-Squid Line Attachment

e. Suspension lines and anti-squid line from canopy skirt hem to confluence points for frays, ruptures, dirt, lumps, hard or thin spots, protruding inner core lines, presence of twists in individual lines, attachment of suspension lines and V-tabs at skirt hem, and security and condition of wrapping at confluence point.

f. Braided tubular cover for frays, ruptures, dirt, lumps, hard or thin spots, security of wrappings, and serving at the eye.

g. Extender strap for contamination, mildew, cuts, tears, burns, fraying, and loose or missing stitches.

h. Drogue shackle for nicks, burrs, dirt, and corrosion.

i. Attachment bolt for nicks, burrs, dirt, corrosion, and stripped threads.

j. Link line webbing for fraying, cuts, tears, mildew; neoprene sleeve for cuts; pins for nicks, burrs, dirt, and corrosion.

8. CONTAINER ASSEMBLY.

a. Interior of container for foreign objects, corrosion, cleanliness, and structural integrity.

b. Container for cracks. Cracks one inch long near holes securing the metal strip and flaps to container are acceptable.

c. Flaps for contamination, mildew, fraying, cuts, tears, loose or broken stitches, and security of attachment.

d. Grommets and wire loop for nicks, burrs, dirt, corrosion, and security of attachment.

9. SUSPENSION LINE CONTINUITY CHECK.

a. Continuity check (QA):

(1) Walk anti-squid line from tunnel of confluence point to skirt hem of stabilizer drogue.

(2) Hold anti-squid line at skirt hem, from two groups of twelve lines each.

(3) Ensure anti-squid line is retainer in central position with twelve lines on either side.

(4) Ensure suspension lines are not crossed or entangled at confluence point (Figure 8).

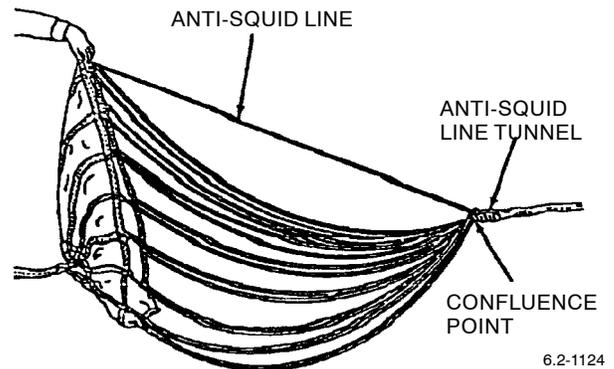


Figure 8. Continuity Check

b. Stretch controller drogue taut and form 2 groups of 5 lines each; position each group to either side of anti-squid line. Make certain that anti-squid line is retainer in central position with 5 lines on each side (Figure 9).

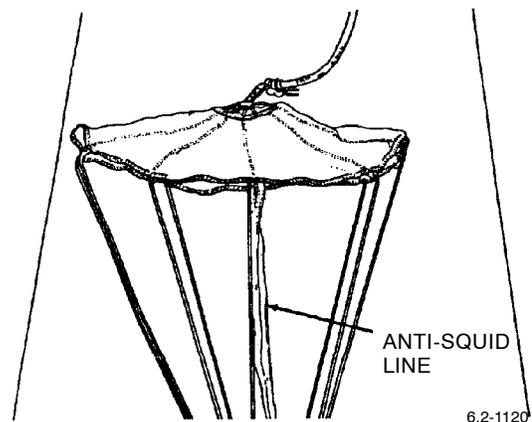


Figure 9. Stretch Controller Drogue Taut

10. RIGGING.

11. ATTACHMENT OF CONNECTING LINE TO CONTROLLER DROGUE AND STABILIZER DROGUE.

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Pass one looped end of connecting line thru base loop of controller drogue (Figure 10). Route opposite end of line thru loop and pull tight. Tack loop with one turn of size 6 thread, double and waxed; tie off.

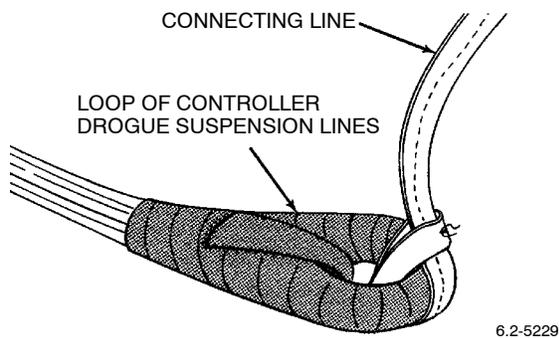


Figure 10. Attachment of Connecting Line to Controller Drogue

b. Pass free end loop of connecting line around apex suspension lines of stabilizer drogue (Figure 11). Route complete controller drogue thru loop of connecting line and pull tight. Tack loop with one turn of size 6 thread, double and waxed; tie off.

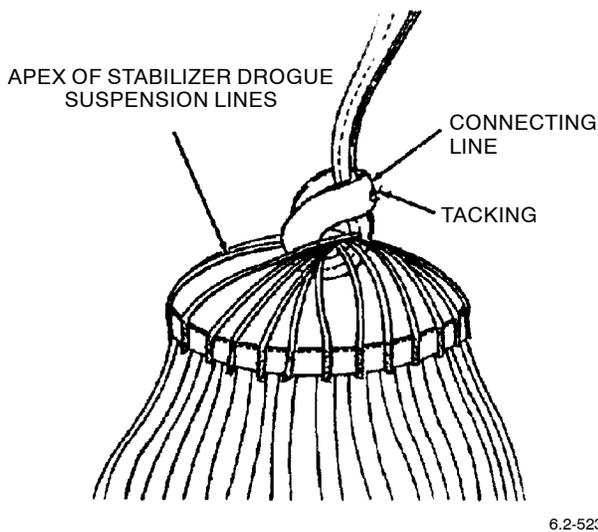


Figure 11. Attachment of Connecting Line to Stabilizer Drogue

12. ATTACHMENT OF ANTI-SQUID LINE TO CONTROLLER DROGUE.

a. Pass large loop end of anti-squid line thru loop inside drogue suspension line union.

b. Pass small loop end of anti-squid line thru large loop and pull tight to form a knot (Figure 12).

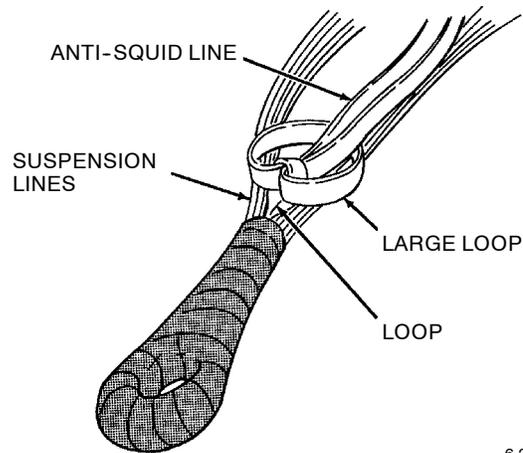


Figure 12. Attachment of Anti-Squid Line to Controller Drogue

13. ATTACHMENT OF EXTENDER STRAP, LINK LINE, AND SHACKLE TO STABILIZER DROGUE.

a. Pass extender strap thru eye end of main drogue suspension lines (Figure 13).

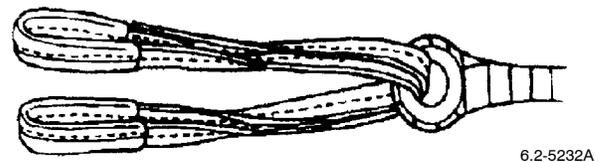


Figure 13. Pass Extender Strap thru Eye

b. Position end loops of straps on shackle (Figure 14).

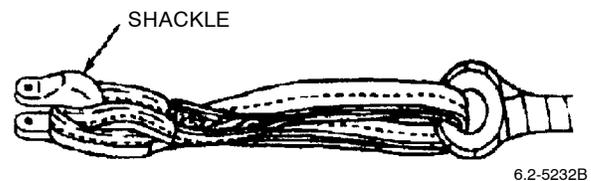


Figure 14. Positioning of End Loops

c. Wrap with four turns of electrical insulation tape in three places (Figure 15).

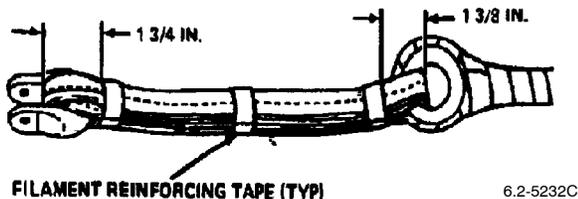


Figure 15. Wrapping with Filament Tape

d. Install link line on drogue shackle, ensure drogue shackle nut is in the uppermost position. Tighten drogue shackle nut until one complete thread is visible. (QA)

14. ATTACHMENT OF DROGUE WITHDRAWAL LINE TO CONTROLLER DROGUE.

a. Draw edges of withdrawal line upward to butt at centerline of shackle (Figure 16).

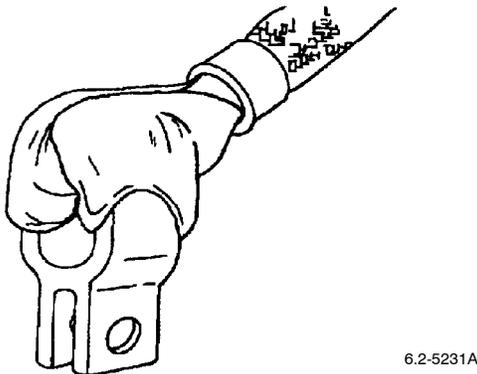


Figure 16. Draw Up Edges to Shackle

b. Using size FF thread, doubled and waxed, whip-stitch edges together (Figure 17). Stitches to be about 1/8-in. and 1/8-in. from edges of withdrawal line. Normally, only six stitches will be required. Tie off. (QA)

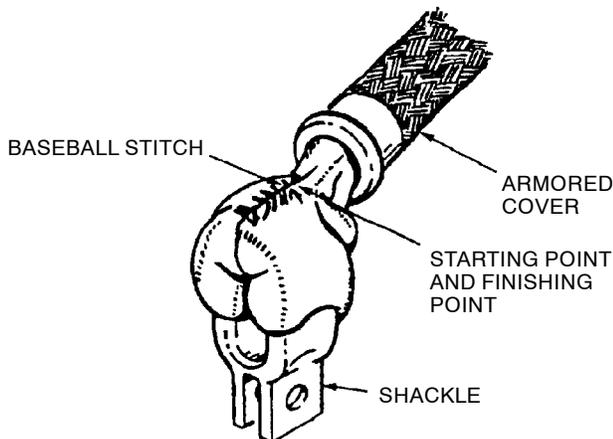


Figure 17. Whipstitch Edges Together

c. Hold five controller drogue apex lines centrally to form two clear diametrically opposite openings. Pass loop end of drogue withdrawal line in one side of centrally held apex lines, thru small loop of anti-squid line and out other side of apex lines (Figure 18).

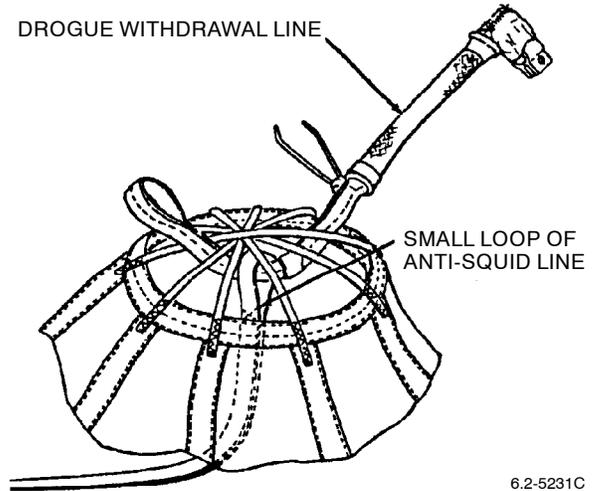


Figure 18. Holding Five Controller Drogue Apex Lines

d. Pass spool/shackle end of withdrawal line over outside of apex lines and thru loop at opposite end of withdrawal line (Figure 19). Pull tight to form Lark's head knot. Tack with one turn of size 6 thread, doubled and waxed; tie off. (QA)

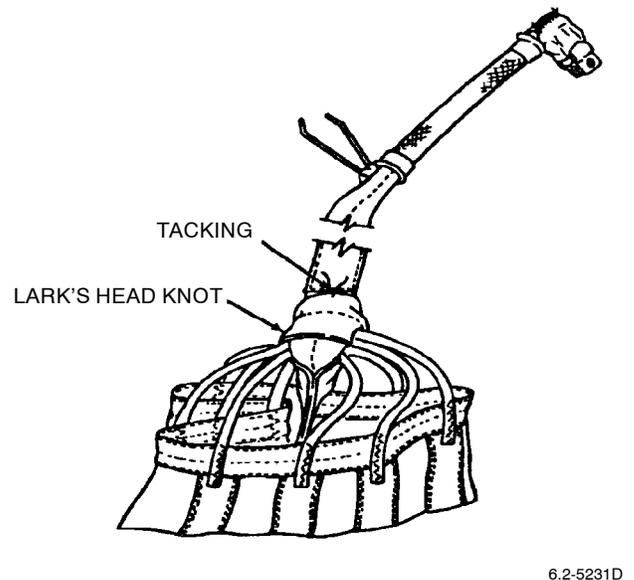
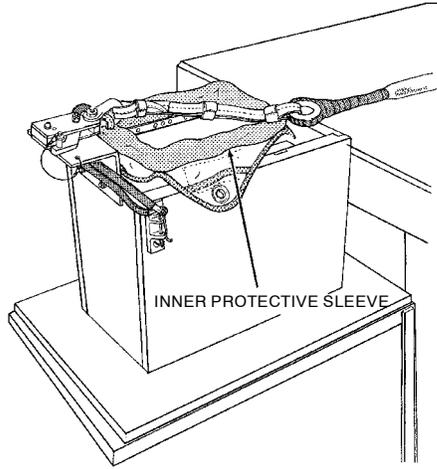


Figure 19. Pass Spool/Shackle End of Line Over Apex Lines

15. LAYOUT OF RIGGED ASSEMBLY.

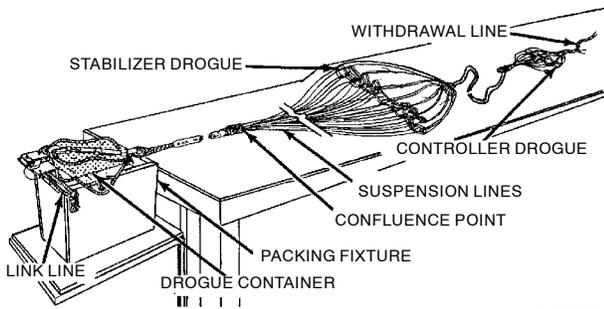
a. Open and spread four flaps of drogue parachute container; pull up inner protective sleeve and roll it inside out or pull down over container edge (Figure 20).



6.2-5233A

Figure 20. Open and Spread Four Flaps

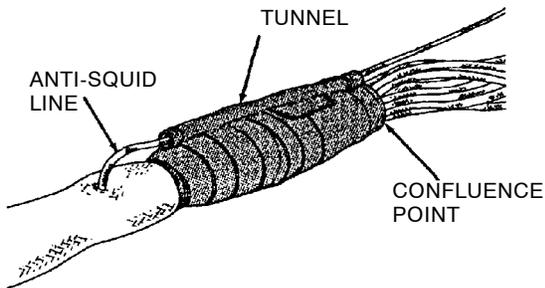
b. Lay out drogue assembly on a clean packing table, securing link line, drogue shackle, and scissor shackle to packing stand (Figure 21).



6.2-5233B

Figure 21. Lay Out Drogue Assembly

c. Spread stabilizer drogue out drawing suspension lines taut, and position anti-squid line tunnel upward (Figure 22).



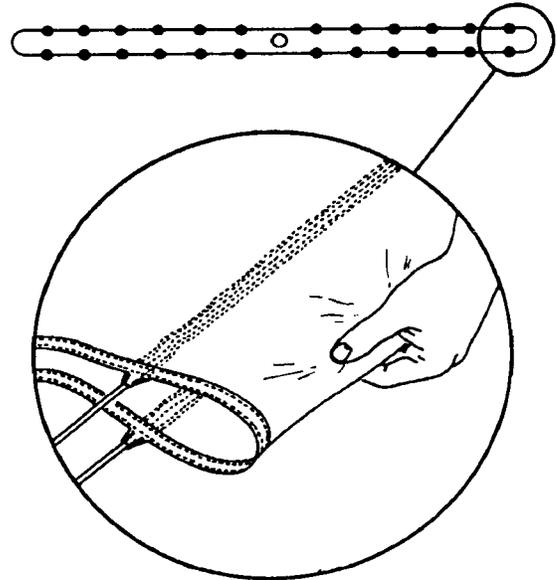
6.2-5729B

Figure 22. Positioning of Anti-Squid Line Tunnel

16. PACKING.

17. FOLDING OF STABILIZER DROGUE.

a. Pair off suspension lines and align V-tabs. There shall be six pairs on each side of anti-squid line (Figure 23).

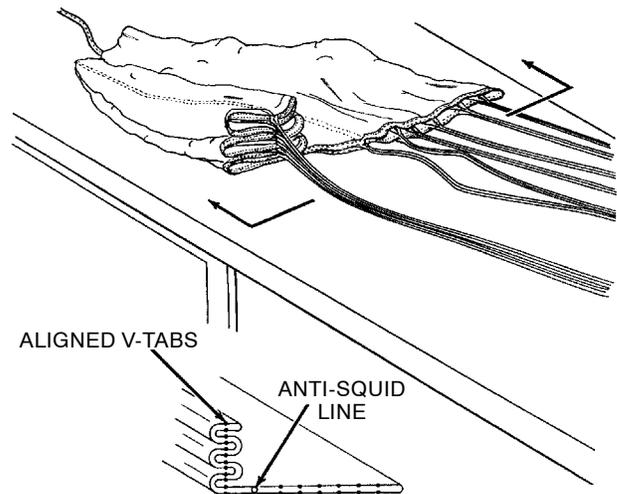


PAIRED SUSPENSION LINES

6.2-5234A

Figure 23. Pair Off Suspension Lines

b. S-fold packer's side of canopy maintaining alignment of V-tabs (Figure 24).



6.2-5234B

Figure 24. S-Fold Packer's Side of Canopy

c. Repeat same operation for helper's side. Ensure that anti-squid line is positioned between two groups of folds and suspension lines. Check that anti-squid lines are properly routed between two groups of suspension lines (Figure 25). (QA)

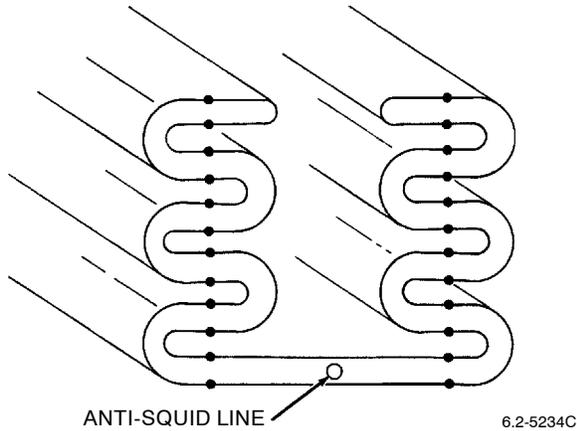


Figure 25. S-Fold Helper's Side of Canopy

d. Grasp two sets of folds at skirt hem and rotate group of folds on helper's side under group of folds on the packer's side (Figure 26).

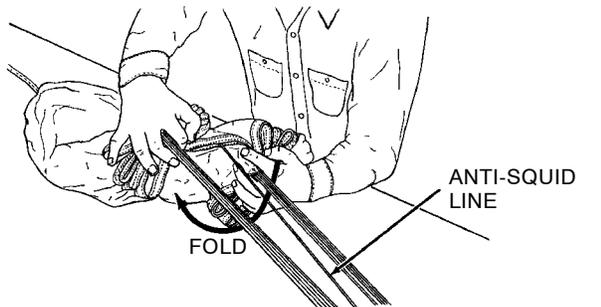


Figure 23. Grasping Two Sets of Folds

e. Straighten folds and fold canopy together; align V-tabs and ensure that anti-squid line is free to confluence point (Figure 27).



Figure 24. Straighten Folds

f. Place shot bags on folded stabilizer drogue canopy (Figure 28).

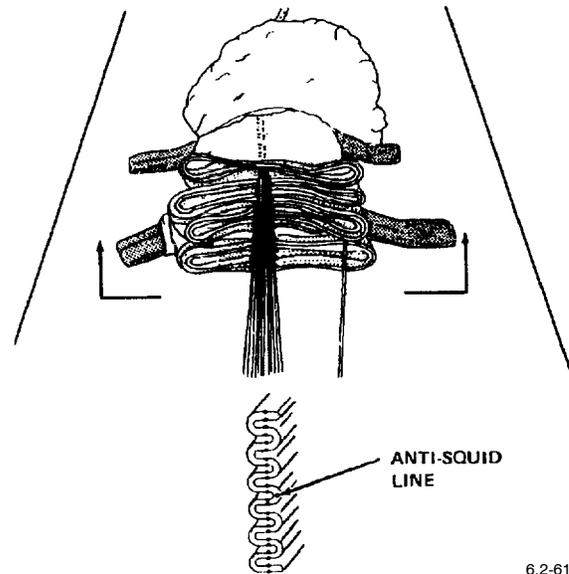


Figure 28. Placement of Shot Bags

18. STOWING OF STABILIZER DROGUE AND SUSPENSION LINES.

NOTE

Direction of flight will determine front, rear, right, and left reference points.

a. Route drogue extender strap down along inside left rear corner of container. Pack sleeve-protected suspension lines in bottom of container from left to right along rear container edge (Figure 29). (QA)

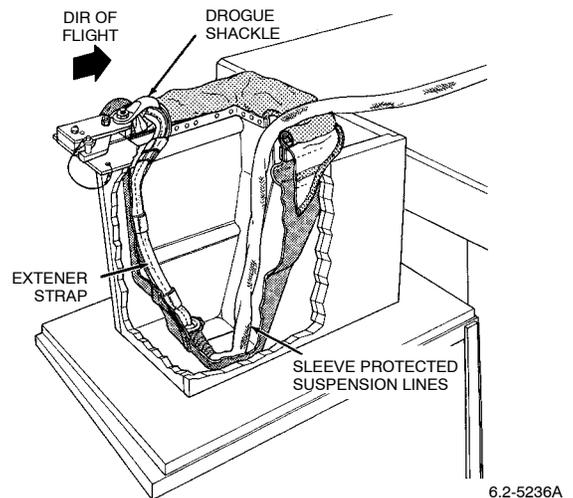


Figure 29. Route Drogue Extender Strap

NOTE

Pack line well into all corners, do not waste any space.

b. Route drogue sleeve-protected suspension lines in four tightly packed rows in bottom of container running from left to right while working toward container front (Figure 30).

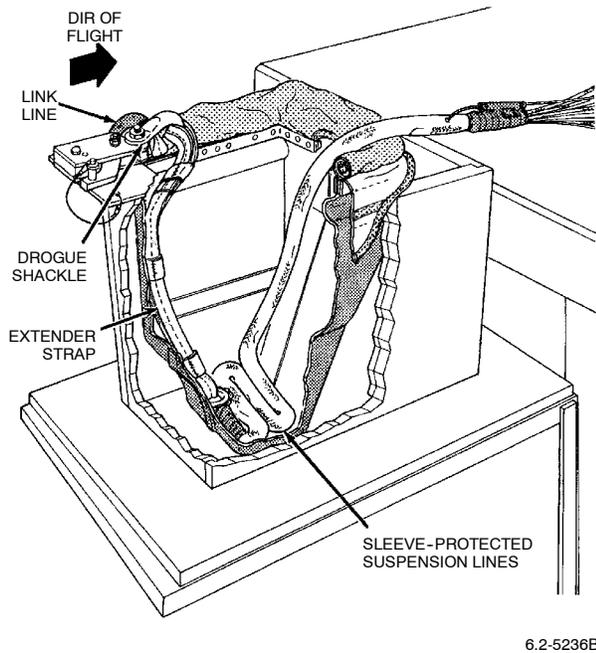


Figure 30. Route Drogue Sleeve-Protected Suspension Lines

c. Continue routing drogue sleeve protected suspension lines tightly on top of first layer in same manner, working toward rear of container. Pack wrapped confluence point with tunnel between sleeve protected suspension lines and suspension lines. (QA)

NOTE

Pack suspension lines on top of drogue sleeve protected suspension lines as tightly as possible. Do not waste any space.

d. Pack stabilizer drogue suspension lines on top of packed drogue sleeve protected suspension lines, routing them from left to right of container. Ensure that drogue suspension lines are properly routed and free of entanglements. (QA)

e. Remove shot bags from folded stabilizer drogue. Grasp folded stabilizer drogue canopy at lower edge. Insert canopy into container on top of packed suspension lines, butting canopy skirt hem against rear of container. Continue stowing canopy into container using accordion folds from front to rear, packing each fold as tightly as possible and finally opening out apex of drogue to lie flat on top (Figure 31).

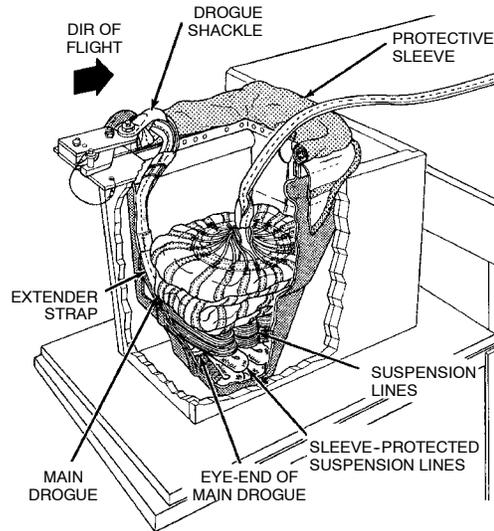


Figure 31. Removal of Shot Bags

f. Pack connecting line directly on top of packed canopy by standing connecting line on its edge. Route connecting line along front of container, tightly running it from side to side, working toward rear of container. Pack entire connecting line in this manner until a length of 12 to 14-in. remains (Figure 32). (QA)

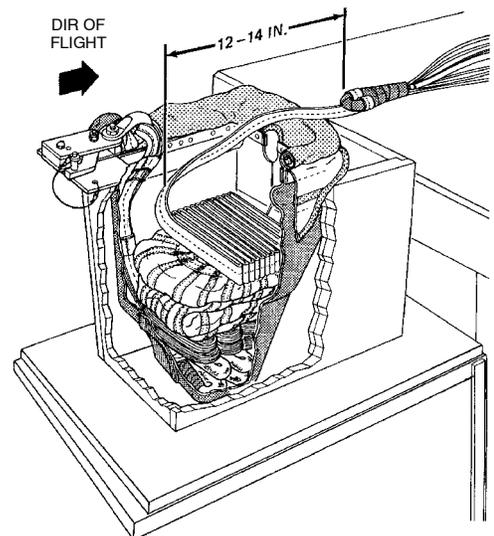


Figure 32. Pack Connecting Line on Top

g. Place remaining length of connecting line over left rear corner of container (Figure 33).

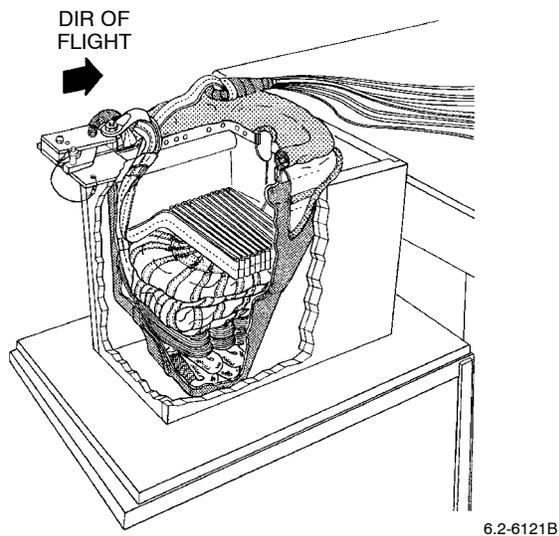


Figure 33. Placement of Remaining Length

h. Pull up protective sleeve. Fold rear, left, front, and right sides of sleeve down in that order. Ensure that drogue parachute assembly is firmly packed. Adjustment of internal mass by external hand pressure is permissible (Figure 34).

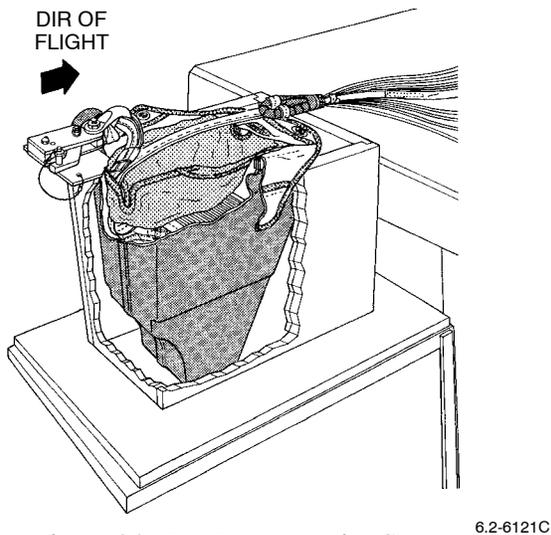


Figure 34. Pull Up Protective Sleeve

WARNING

Packing fixture shall be utilized to prevent passing the stabilizer connecting line outboard of shackle.

i. Route remaining length of stabilizer drogue connecting line forward on top of folded sleeve. Position terminal eye of controller drogue in left rear corner of container (Figure 35).

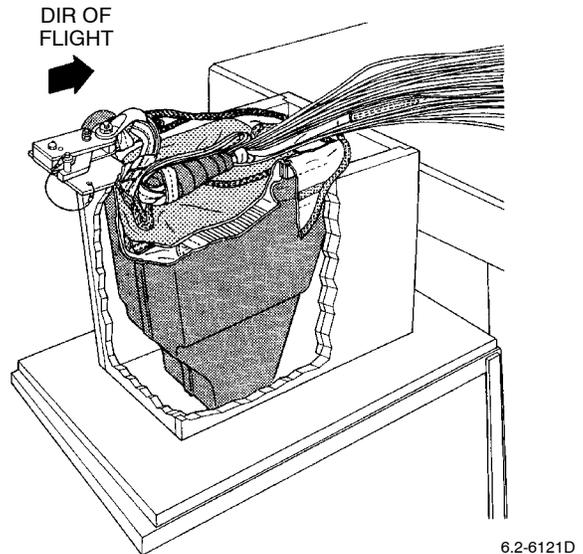


Figure 35. Route the Remaining Length

19. FOLDING AND STOWING OF CONTROLLER DROGUE.

a. Stretch controller drogue parachute taut and ensure that anti-squid lines are not entangled with suspension lines. Pair off suspension lines and straighten canopy (Figure 36).

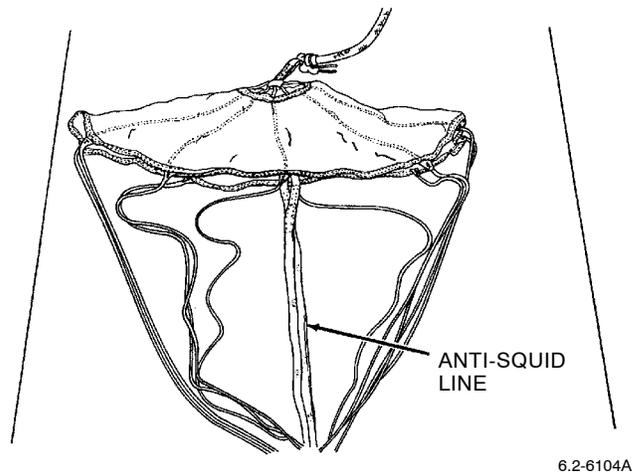
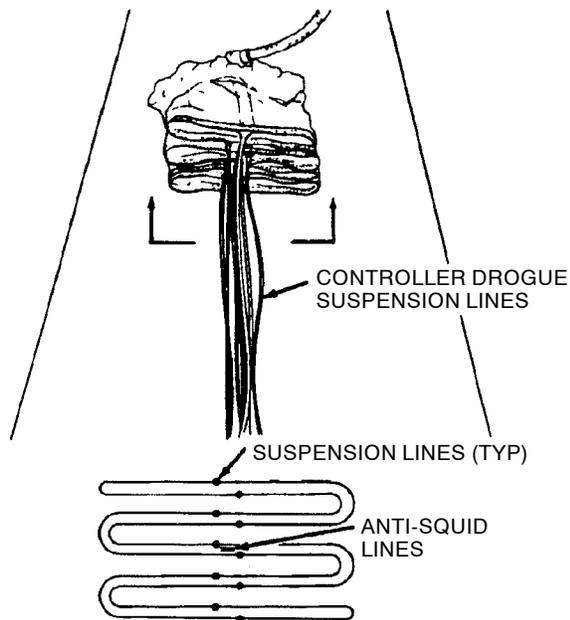


Figure 36. Stretch Controller Drogue Taut

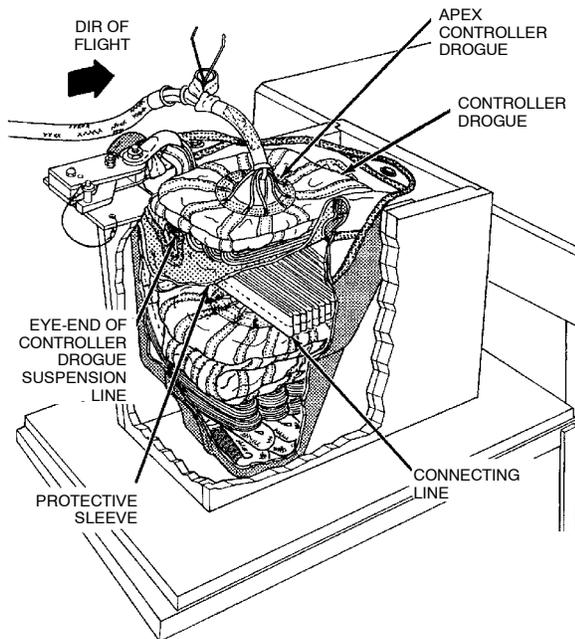
b. Fold drogue into four folds, adjust to stagger suspension lines and reduce bulk in center (Figure 37). (QA)



6.2-6104B

Figure 37. Fold Drogue Into Four Folds

c. Stow controller drogue suspension lines on top of folded sleeve, from front to rear of container. Pack drogue by stowing skirt hem into rear of container, lay to front, fold back, and open out apex so that it lies flat (Figure 38). (QA)



6.2-6122C

Figure 38. Store Controller Drogue Suspension Lines

WARNING

Drogue withdrawal line must be forward of extender strap, and both must emerge from left rear corner between the left and rear securing flaps.

d. Install the protective cover with the radius cover at the controller drogue withdrawal line.

e. Using packing fid, tuck each side of protective cover into container between container and the 22-in. drogue canopy.

f. Pull container flaps up; withdrawal line and extender strap shall remain between rear and left flaps.

20. CLOSING OF CONTAINER.

NOTE

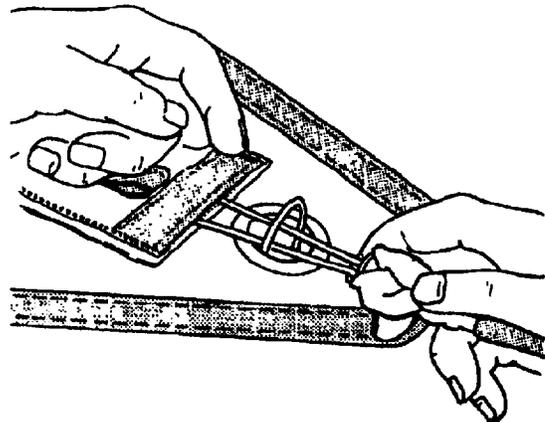
Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Close rear, right, left, and front securing flaps, passing wire loop on rear flap thru eyelets of other flaps. (QA)

WARNING

Controller drogue withdrawal line must be routed over all other lines so that drogues may be withdrawn without any danger of entanglement.

b. Insert securing pin attached to drogue withdrawal line thru wire loop and into fabric pocket on front flap (Figure 39).



6.2-6105A

Figure 39. Insert Securing Pin

c. Pass length of size 6 thread, waxed and single, thru flap securing pin, then thru fabric loop on pocket; tie off. Cut off excess cord (Figure 40). (QA)

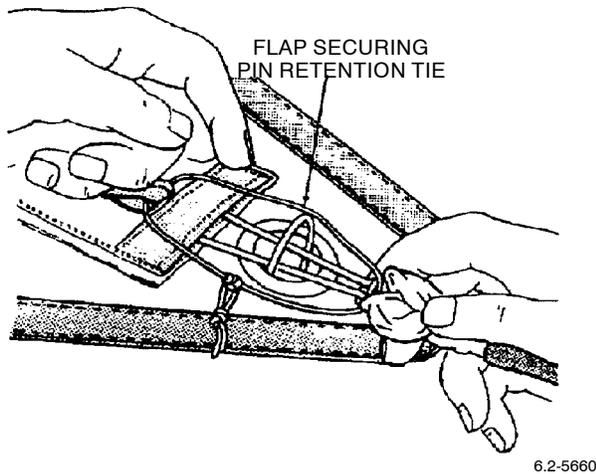


Figure 40. Safety Securing Pin

d. Retention-tie drogue shackle with one turn of size 6 thread, waxed and single, routed thru loop of extender strap, thru shackle, and around both legs of securing pin forward of wire loop; tie off (Figure 41). (QA)

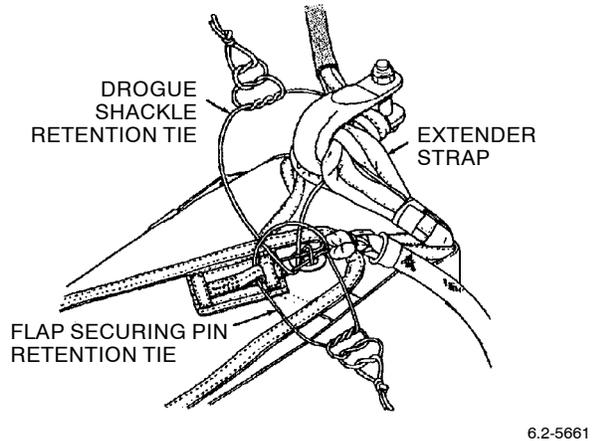


Figure 41. Retention-Tie Drogue Shackle

e. Disconnect link line from packing fixture, open scissor shackle, and remove drogue shackle. Remove drogue container from packing stand.

21. FINAL CHECKOUT.

a. Account for all packing tools.

b. Examine packed drogue parachute for general condition.

c. Packer shall complete and sign Parachute Record (OPNAV 4790/101). (QA)

d. QA inspector shall examine completeness and accuracy of all entries on Parachute Record (OPNAV 4790/101).

e. QA inspector shall sign Parachute Record (OPNAV 4790/101).

f. Send a (legible) copy of new Parachute Record to: Commander, Code 461000D, NAVAIRWARCENWPN-DIV, 1900 N Knox Road Stop 6206, China Lake, CA 93555-6106.

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INTERMEDIATE AND DEPOT MAINTENANCE

REPAIR PROCEDURES

MK-GRU7/MK-GRU7A/MK-GRUEA7 DROGUE PARACHUTE SYSTEM

List of Effective Work Package Pages

<u>Page</u> <u>No.</u>	<u>Chg.</u> <u>No.</u>	<u>Page</u> <u>No.</u>	<u>Chg.</u> <u>No.</u>	<u>Page</u> <u>No.</u>	<u>Chg.</u> <u>No.</u>	<u>Page</u> <u>No.</u>	<u>Chg.</u> <u>No.</u>
1 thru 7	10						

Reference Material

Intermediate and Depot Maintenance, Common Repairs	WP 004 00
Intermediate and Depot Maintenance, Packing Procedures, MK-GRU7/MK-GRU7A/ MK-GRUEA7 Drogue Parachute System	WP 017 01
Introduction, Organizational, Intermediate and Depot Maintenance with Illustrated Parts Breakdowns, Emergency Personnel and Drogue Parachute Systems	WP 002 00
Organizational, Intermediate and Depot Maintenance, Parachute Loft Requirements/Administration	WP 003 00
Organizational, Intermediate and Depot Maintenance, Support Equipment	WP 005 00

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Replacement of Controller Drogue	4
Replacement of Controller Drogue Withdrawal Line	4
Replacement of Drogue Container Grommets on Flap Assembly	6
Replacement of Drogue Sleeve Assembly for MK-GRU7/MK-GRUEA-7 (EA-6B)	3
Replacement of Extender Strap and Shackle	2
Replacement of Link Line	5
Replacement of Protective Cover Assembly	7
Repair of Holes, Tears or Snags Drogue Canopy (Depot Only)	6
Replacement of Stabilizer Drogue	2
Introduction	2

Record of Applicable Technical Directives

None

1. INTRODUCTION.

a. This Work Package (WP) contains instructions for maintenance, repair, replacement, and fabrication of various drogue parachute parts or subassemblies to ensure that proper items of equipment remain in a Ready-For-Issue (RFI) status. For common repairs refer to WP 004 00.

2. DROGUE PARACHUTE ASSEMBLY REPAIRS.

a. Repair of drogue parachute is limited to the following:

- (1) Cleaning of contaminated areas.
- (2) Replacement of stabilizer drogue, controller drogue, connecting line, extender strap and shackle, link line, and withdrawal line.

(3) Repair of holes, tears or snags in canopy 1/4-in. in diameter or 1/2-in. in length.

3. REPLACEMENT OF EXTENDER STRAP AND SHACKLE.

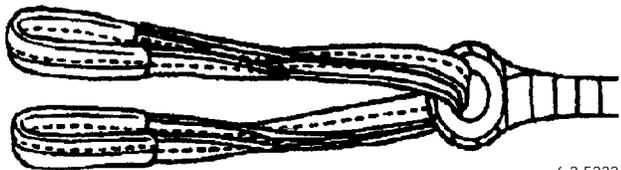
Materials Required

Specification or Part Number	Nomenclature
MIL-I-19166	Insulation Tape, Electrical 3/4-in. Wide

a. Cut tape and remove extender strap and shackle from stabilizer drogue.

b. Inspect replacement extender strap and/or shackle per WP 017 01.

c. Pass extender strap thru eye end of main drogue suspension lines (Figure 1).



6.2-5232A

Figure 1. Pass Extender Strap thru Eye

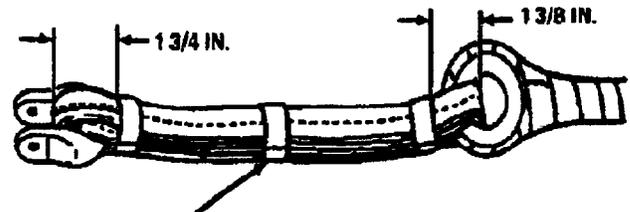
d. Position end loops of straps on shackle (Figure 2).



6.2-5232B

Figure 2. Positioning of End Loops

e. Wrap with four turns of electrical insulation tape in three places (Figure 3). (QA)



6.2-5232C

FILAMENT REINFORCING TAPE (TYP)

Figure 3. Wrap with Electrical Insulation Tape

f. Mark date placed in service on extender strap. (QA)

g. Make proper entries on Parachute Record (OPNAV 4790/101). (QA)

4. REPLACEMENT OF STABILIZER DROGUE.

Material Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Cut tape and remove extender strap and shackle from stabilizer drogue.

b. Cut tacking on connecting line at apex of stabilizer drogue.

c. Route complete controller drogue thru loop of connecting line at apex of stabilizer drogue.

d. Dispose of stabilizer drogue per supply directives.

e. Inspect replacement stabilizer drogue per WP 017 01.

f. Pass free end loop of connecting line around apex suspension lines of replacement stabilizer drogue (Figure 4). Route complete controller drogue thru loop of connecting line and pull tight. Tack loop with one turn of size 6 thread, double and waxed; tie off. (QA)

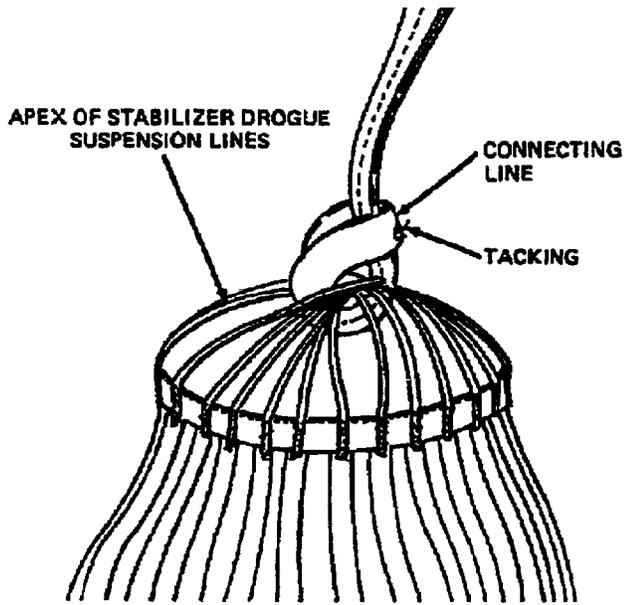


Figure 4. Replacement of Stabilizer Drogue

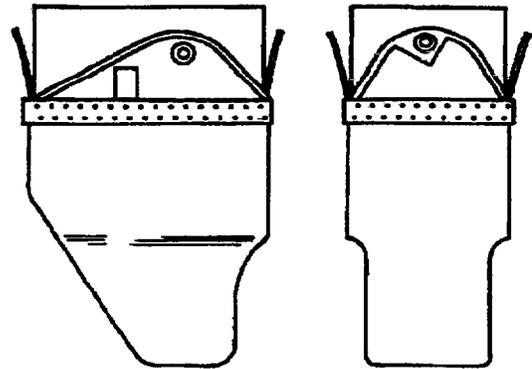


Figure 5. Replacement of Drogue Sleeve Assembly

g. Mark date placed in service on stabilizer drogue.

h. Make proper entries on Parachute Record (OPNAV 4790/101). (QA)

5. REPLACEMENT OF DROGUE SLEEVE ASSEMBLY FOR MK-GRU7/MK-GRUEA7 (EA-6B).

Materials Required

Specification or Part Number	Nomenclature
MB300-335	Sleeve Assembly, Drogue
MS35206-242	Screw
MBEU12140	Nut

a. Remove 28 screws and nuts securing drogue sleeve to drogue container. Retain screws and nuts. Discard removed sleeve assembly.

b. Install new drogue sleeve. Ensure that sleeve assembly is installed correctly. Install screws and nuts securing sleeve to drogue container (Figure 5).

6. REPLACEMENT OF CONNECTING LINE.

Materials Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Cut tacking on connecting line at apex of stabilizer drogue.

b. Route complete controller drogue thru loop of connecting line at apex of stabilizer drogue.

c. Cut tacking on connecting line at base loop of controller drogue and remove connecting line.

d. Inspect replacement connecting line per WP 017 01.

e. Pass one looped end of replacement connecting line thru base loop of controller drogue (Figure 6). Route opposite end of line thru loop and pull tight. Tack loop with one turn of size 6 thread, doubled and waxed; tie off.

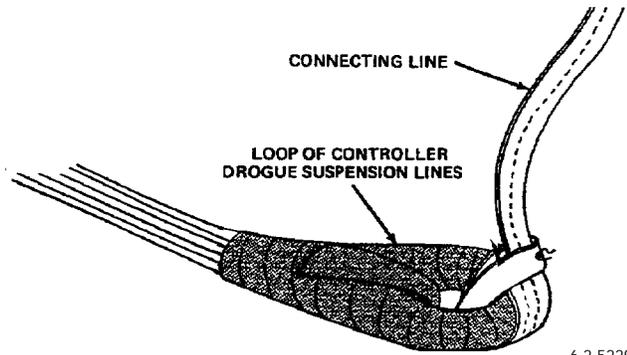


Figure 6. Replacement of Controller Drogue

f. Pass free end loop of connecting line around apex suspension lines of stabilizer drogue (Figure 4). Route complete controller drogue thru loop of connecting line and pull tight. Tack loop with one turn of size 6 thread, double, and waxed; tie off. (QA)

g. Mark date placed in service on connecting line.

h. Make proper entries on Parachute Record (OPNAV 4790/101). (QA)

7. REPLACEMENT OF CONTROLLER DROGUE.

Materials Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A

NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Cut withdrawal line tacking at apex of controller drogue and remove withdrawal line.

b. Cut tacking on connecting line at apex of stabilizer drogue.

c. Route controller drogue thru loop of connecting line at apex of stabilizer drogue.

d. Cut tacking on connecting line at base loop of controller drogue and remove connecting line.

e. Dispose of controller drogue per current supply directives.

f. Inspect replacement controller drogue per WP 017 01.

g. Pass one looped end of connecting line thru base loop of replacement controller drogue (Figure 6). Route opposite end of line thru loop and pull tight. Tack loop with one turn of size 6 thread, double and waxed; tie off. (QA)

h. Pass free end loop of connecting line around apex suspension lines of stabilizer drogue (Figure 4). Route complete controller drogue thru loop of connecting line and pull tight. Tack loop with one turn of size 6 thread, double and waxed; tie off.

i. Reinstall controller drogue withdrawal line per Paragraph 8.

j. Mark date placed in service on controller drogue.

k. Make proper entries on Parachute Record (OPNAV 4790/101). (QA)

8. REPLACEMENT OF CONTROLLER DROGUE WITHDRAWAL LINE.

Materials Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size FF, Type I and II, Class A
V-T-295	Thread, Nylon, Size 6, Type I or II, Class A

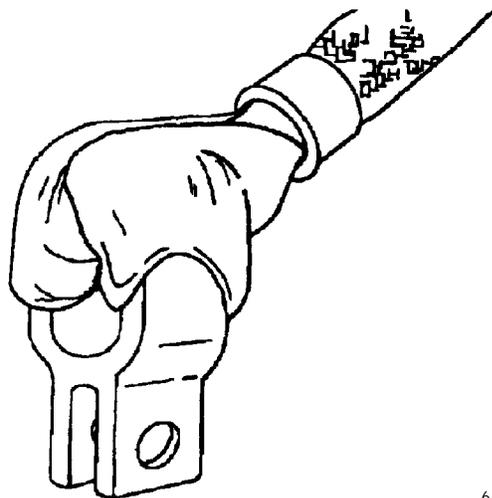
NOTE

Tie off all tackings with a surgeon's knot topped with a square knot, followed with a binder knot per WP 002 00. Trim off excess leaving 1/2-in.

a. Cut withdrawal line tacking at apex of controller drogue and remove withdrawal line.

b. Inspect replacement withdrawal line per WP 017 01.

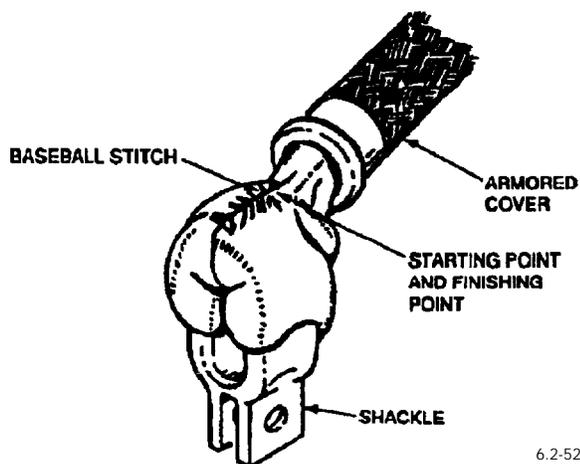
c. Draw edges of withdrawal line upward to butt at centerline of shackle (Figure 7).



6.2-5231A

Figure 7. Draw Up Edges to Shackle

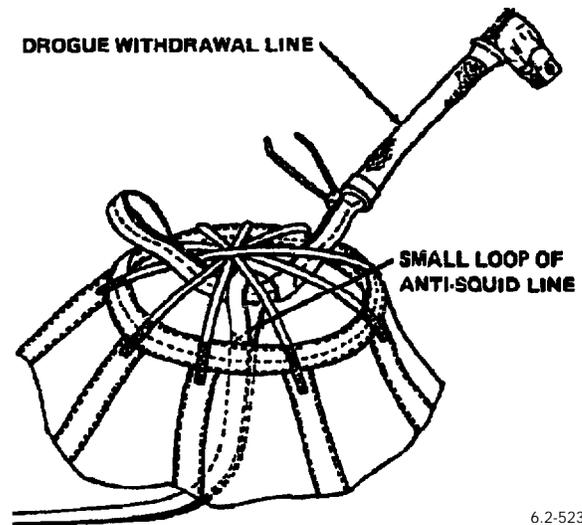
d. Using a length of size FF thread, doubled and waxed. Baseball stitch edges together. Stitches to be about 1/4-in. apart and 1/4-in. from edges of withdrawal line. Start and finish stitch at armored cover end, alternating stitches from one edge of withdrawal line. Start and finish stitch at armored cover end, alternating stitches from one edge of withdrawal line to the opposite edge about 6 stitches, tie off (Figure 8). (QA)



6.2-5231B

Figure 8. Whipstitch Edges Together

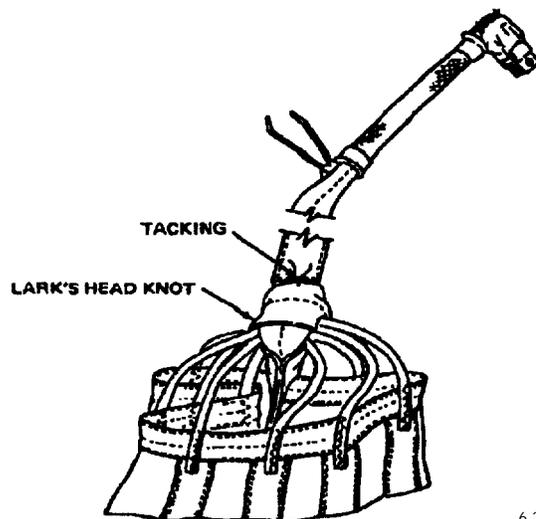
e. Hold five controller drogue apex lines centrally to form two clear diametrically opposite openings. Pass loop end of drogue withdrawal line in one side of centrally held apex lines, thru small loop of anti-squid line and out other side of apex lines (Figure 9).



6.2-5231C

Figure 9. Holding Five Controller Drogue Apex Lines

f. Pass spool/shackle end of withdrawal line over outside of apex lines and thru loop at opposite end of withdrawal line (Figure 10). Pull tight to form Lark's head knot. Tack with one turn of size 6 thread, doubled and waxed; tie off. (QA)



6.2-5231D

Figure 10. Pass Spool/Shackle End of Line Over Apex Lines

9. REPLACEMENT OF LINK LINE.

- a. Remove link line from drogue shackle.
- b. Inspect replacement link line per WP 017 01.
- c. Install replacement link line on drogue shackle and tighten shackle bolt until one thread is visible. (QA)

d. Mark date placed in service on link line.

e. Make proper entries on Parachute Record (OPNAV 4790/101). (QA)

e. If crimped edge of the grommet has any sharp edged, remove two rows of stitches around patch and repeat steps a thru d.

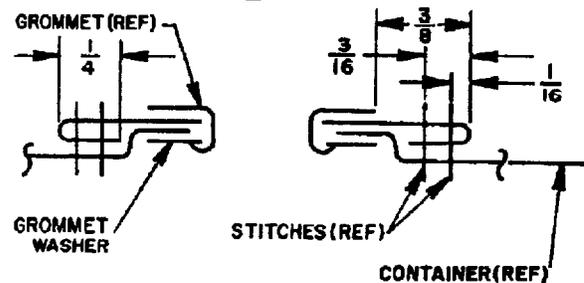
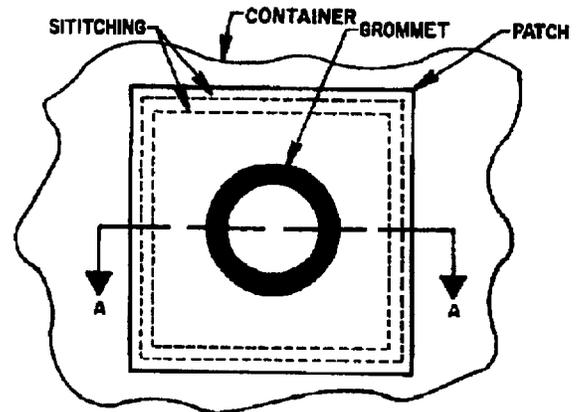
10. REPLACEMENT OF DROGUE CONTAINER GROMMETS ON FLAP ASSEMBLY.

Support Equipment

Part Number	Nomenclature
9765	Chuck, Washer 7/16-in.
9764	Die, Grommet 7/16-in.

Materials Required

Specification or Part Number	Nomenclature
MS20230B3	Grommet, Metallic, Size 3, Plain
MIL-C-7219	Cloth, Nylon, Class 3
V-T-295	Thread, Nylon, Size E, Type I or II, Class A



6.2-604

Figure 11. Replacement of Grommets

a. Cut a 2 1/4-in. square patch. Place over hole. Turn raw edges under 1/4-in. Stitch in placed on all four sides with two rows of stitching using size E thread. Back stitch 1/2-in. (Figure 11).

b. Cut a 7/16-in. diameter hole center of patch.

NOTE

Flat side of replacement grommet shall face release pin.

c. Place grommet washer on underside of flap. Place grommet on topside of patch.

d. Lock grommet and grommet washer in place with correct size chuck and die (Figure 11).

11. REPAIR OF HOLES, TEARS OR SNAGS DROGUE CANOPY (DEPOT ONLY).

Materials Required

Specification or Part Number	Nomenclature
V-T-276	Thread, Cotton, Type 1C1

a. If a thread separation is not severe and no threads are broken, threads can be pressed into place using a soft brush or a pencil eraser. If damaged area is brushed in wrong direction, separation will increase.

b. Darn holes or tears that do not exceed 1/2-in. in length or (1/4-in. x 1/4-in. if circular, a diameter of 5/16-in.).

12. REPLACEMENT OF PROTECTIVE COVER ASSEMBLY.

Materials Required

Specification or Part Number	Nomenclature
V-T-295	Thread, Nylon, Size E, Type I or II, Class A
MIL-C-7219	Cloth, Nylon, Type III, Class 3, Sage Green

NOTE

For all machine stitching, use stitch type 301, ASTM-D-6193, 7 to 11 stitches per inch. Back stitch 1/2-in.

a. Mark and cut one piece of nylon cloth 10-in. by 12-in.

b. Mark per Figure 12.

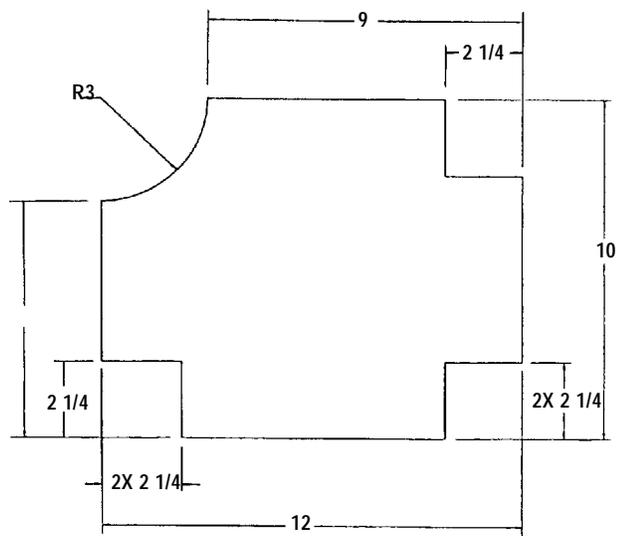


Figure 12. Fabric Marking

c. Sew curved area per Figure 13.

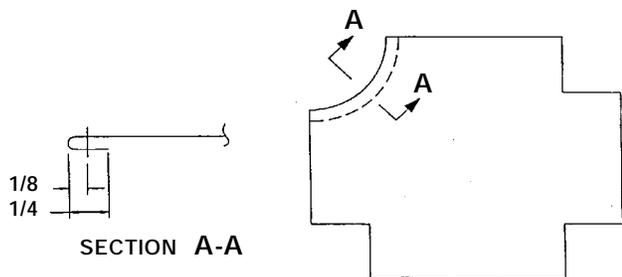


Figure 13. Sew Curved Area

d. Sew remaining edges per Figure 14.

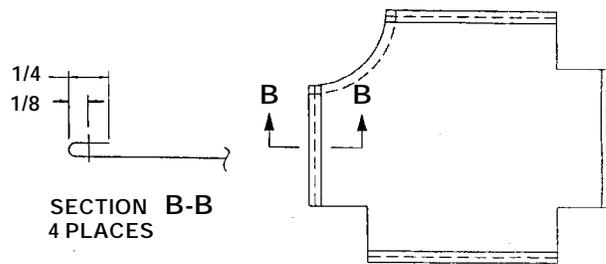


Figure 14. Sew Remaining Edges

e. Fold edges and sew per Figure 15.

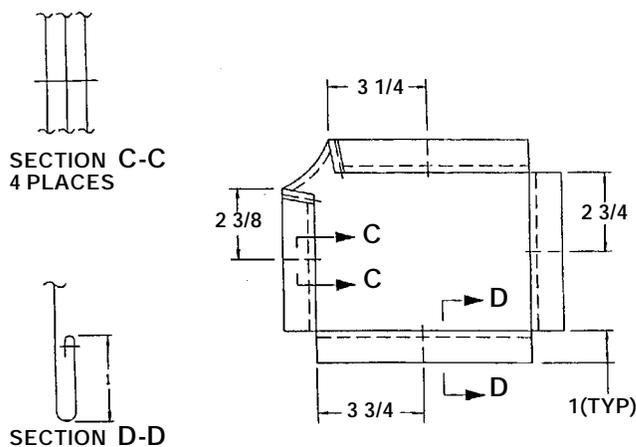


Figure 15. Fold Edges and Sew

f. Sew corners of protective cover per Figure 16. Finished protective cover should look like Figure 16.

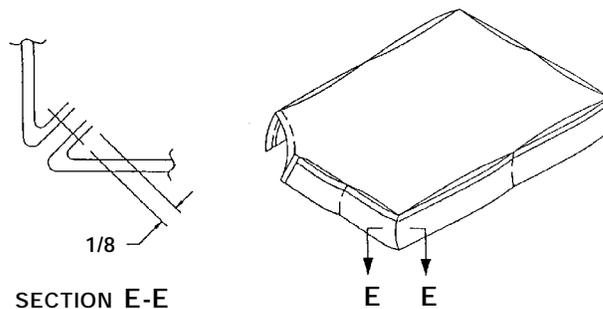


Figure 16. Finished Protective Cover

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ORGANIZATIONAL, INTERMEDIATE AND DEPOT MAINTENANCE

ILLUSTRATED PARTS BREAKDOWN

MK-GRU7/MK-GRU7A/MK-GRUEA7 DROGUE PARACHUTE SYSTEM

List of Effective Work Package Pages

<u>Page No.</u>	<u>Chg. No.</u>						
1	11	2 thru 5	9				

Reference Material

Intermediate and Depot Maintenance, Packing Procedures,
MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System WP 017 01

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Service/Total Life	1
Usable On Codes	1

List of Figures

<u>Title</u>	<u>Page</u>
MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System	2

Record of Applicable Technical Directives

<u>Type/No.</u>	<u>Date</u>	<u>Title and ECP No.</u>	<u>Date Inc.</u>	<u>Rescission Date</u>
		None		

1. INTRODUCTION.

a. This Work Package (WP) contains information for ordering and identifying parts for the MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System (Figure 1).

b. The following usable on codes apply to this WP:

A - EA-6B

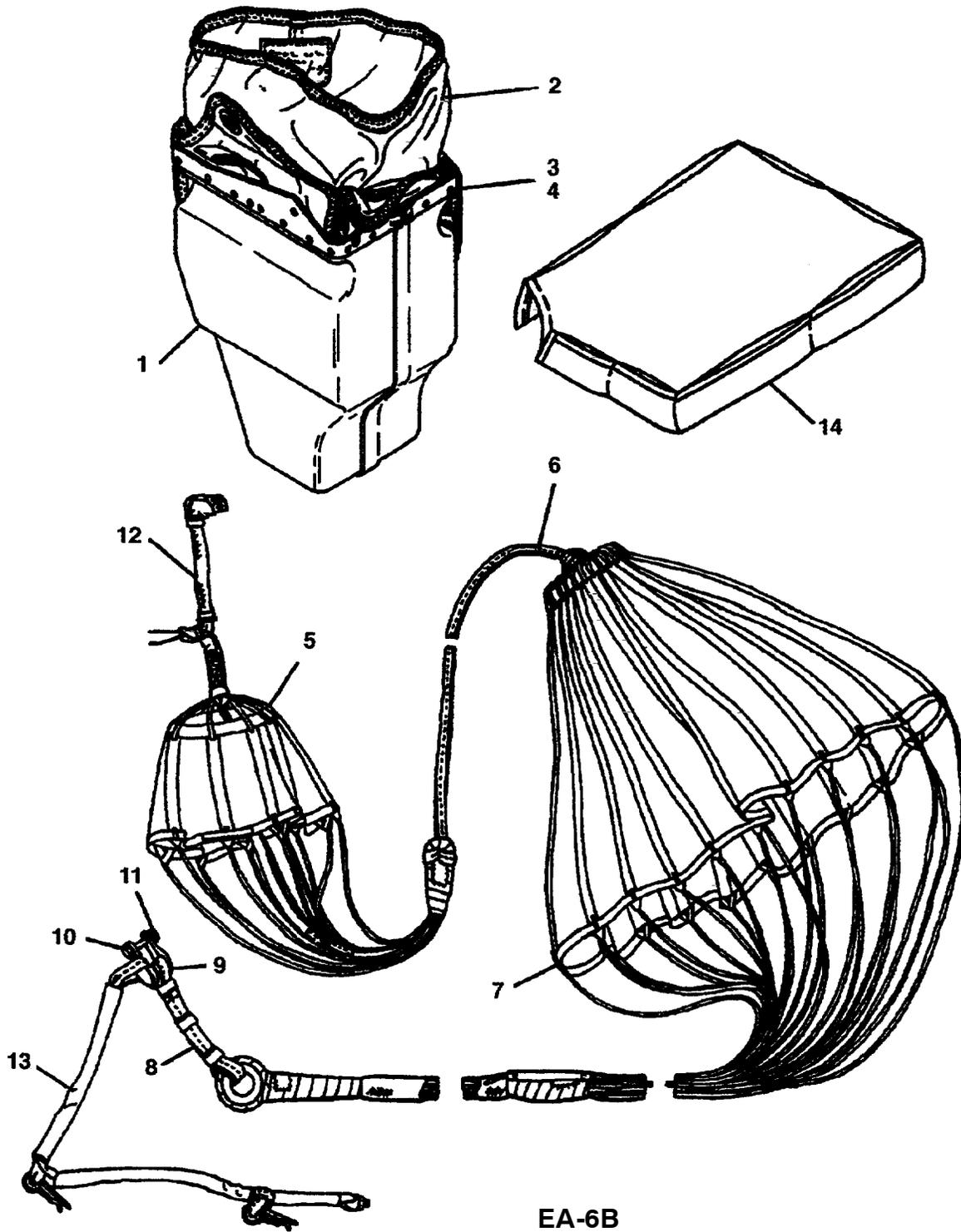
B - F-14

2. USABLE ON CODES.

a. The usable on codes in this WP refer to the aircraft applications for the MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System.

3. SERVICE/TOTAL LIFE.

a. The service/total life information is contained in WP 017 01.



EA-6B

6.2-5754

Figure 1. MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System (Sheet 1 of 2)

INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE	SM&R CODE
	607AS142-1	DROGUE PARACHUTE SYSTEM, MK-GRU7/MK-GRUEA7	REF	A	AGOGG
	MB200-441	DROGUE PARACHUTE SYSTEM, MK-GRU7/MK-GRUEA7	REF	A	AGOGG
1	MBEU1593GRU5	. CONTAINER ASSEMBLY	1		PAGGG
2	MB300-335	. . DROGUE SLEEVE ASSEMBLY	1		PCGGD
3	MS35206-242	. . SCREW	28		PAGZZ
4	MBEU12140	. . NUT	28		PAGZZ
5	MBEU34505	. . CONTROLLER DROGUE	1	*	PCGGG
	MBEU65690	. . CONTROLLER DROGUE	1	*	PCGGG
6	MBEU34010	. . CONNECTING LINE	1		PCGZZ
7	MBEU38271	. . STABILIZER DROGUE	1		PCGZZ
8	MBEU38119	. . EXTENDER STRAP	1		PCGZZ
9	MBEU5940	. . DROGUE SHACKLE	1		PAGZZ
		/ATTACHING PARTS/			
10	MBEU12064	. . BOLT	1		PAGZZ
11	A126G	. . NUT	1		PAGZZ
		---*---			
12	MBEU23177	. WITHDRAWAL LINE, CONTROLLER DROGUE	1		PCGZZ
13	MB300-682	. LINK LINE	1		PAGZZ
14	607AS141-1	. PROTECTIVE COVER	1		MGGZZ

Figure 1. MK-GRU7/MK-GRU7A/MK-GRUEA7 Drogue Parachute System (Sheet 2 of 2)

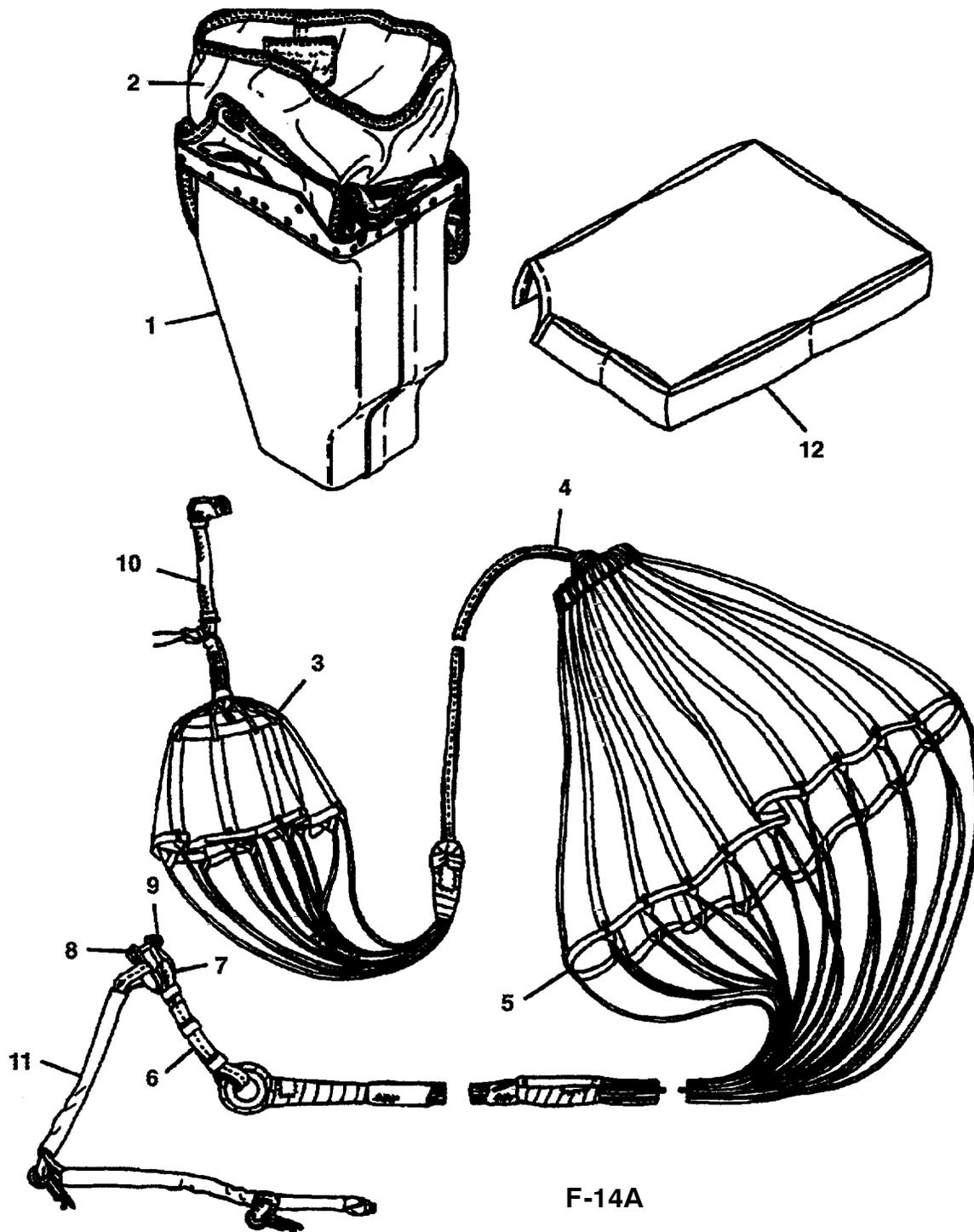


Figure 2. MK-GRU7/MK-GRU7A/MK-GRUEA-7 Drogue Parachute System (Sheet 1 of 2)

INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE	SM&R CODE
	607AS142-2	DROGUE PARACHUTE SYSTEM, MK-GRU7A	REF	B	AGOGG
	MB300-811	DROGUE PARACHUTE SYSTEM, MK-GRU7A	REF	B	AGOGG
1	MB300-809	. CONTAINER ASSEMBLY	1		PAGGG
2	MB300-335	. . DROGUE SLEEVE ASSEMBLY	1		PCGGD
3	MBEU34505	. . CONTROLLER DROGUE	1		PCGGG
	MBEU65690	. . CONTROLLER DROGUE	1		PCGGG
4	MBEU34010	. . CONNECTING LINE	1		PCGZZ
5	MBEU38271	. . STABILIZER DROGUE	1		PCGGG
6	MBEU38119	. . EXTENDER STRAP	1		PCGZZ
7	MBEU5940	. . DROGUE SHACKLE	1		PAGZZ
		/ATTACHING PARTS/			
8	MBEU12064	. . BOLT	1		PAGZZ
9	A126G	. . NUT	1		PAGZZ
		---*---			
10	MBEU23177	. WITHDRAWAL LINE, CONTROLLER DROGUE	1		PCGZZ
11	MB300-684	. LINK LINE	1		PAGZZ
12	607AS141-1	. PROTECTIVE COVER	1		MGGZZ

Figure 2. MK-GRU7/MK-GRU7A/MK-GRUEA-7 Drogue Parachute System (Sheet 2 of 2)

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