***TM 10-1670-251-12&P**

TECHNICAL MANUAL

OPERATOR AND UNIT MAINTENANCE MANUAL

PERSONNEL/CARGO LOWERING DEVICE 500 LB CAPACITY (NSN 1670-00-999-0758)

Approved for public release; distribution is unlimited

***This manual supersedes TM 10-1670-251-12 dated 20 April 1970.**

**HEADQUARTERS,
DEPARTMENT OF THE ARMY
11 June 1991**

TM 10-1670-251-12&P
C1

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 JUNE 1994

Operator and Unit Maintenance Manual
(Including Repair Parts
and Special Tools List)
for
PERSONNEL/CARGO LOWERING DEVICE
500 LB CAPACITY
(NSN 1670-00-999-0758)

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TM 10-1670-251-12&P, 11 June 1991, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
1-5 and 1-6	1-5 and 1-6
1-9 and 1-10	1-9/(1-10 blank)
Index-1 and Index-2	Index-1 and Index-2

2. Retain this sheet in front of manual for reference purposes.

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To be distributed in accordance with DA Form 12-25-E, block no. 1162, requirements for TM 10-1670-251-12&P.

WARNING

Never use a lowering device without first inspecting the complete unit.

When in doubt about the serviceability of any component, replace it.

A rope will not be used more than ten times.

Carefully follow instructions for placing rope in carrying case to insure the rope will come out freely and pass through the governor during lowering operations.

A rope shall not be used for lowering personnel after lowering any load weighing in excess of 300 pounds.

Safety pins for the rope and governor snaphooks shall be used properly to prevent accidental opening of the snaphooks during lowering operations.

Do not attempt to repair damaged components. Replace them.

WARNING

A guide for replacement of components is contained in this manual. Follow the replacement Instructions at all times. A lowering-device log record card is issued for each device to record the number of times each component Is used. Appropriate notations should be made when unserviceable components have been replaced by new ones.

When using the lowering device from a helicopter, care should be exercised to prevent entangling lines in rotor blades. A means of cutting loose ropes should be available in case they become snagged.

Do not lose control of the rope.

WARNING

DEATH could result if inspections are not performed as specified in this manual. Perform all inspections as specified.

DEATH from burns or equipment failure could result if cleaning solvents other than tetrachloroethylene are used in cleaning this equipment. Other solvents shall not be used because of their flammable properties and nylon-damaging substances.

WARNING

Prolonged Inhalation of tetrachloroethylene vapors can cause respiratory injury. Provide adequate ventilation when using it. Also avoid skin contact. Repeated exposure can cause injury. Exercise extreme care when using petroleum products to destroy equipment by fire, as severe burns or DEATH could result.

FIRST AID

For First Aid treatment, refer to FM 21-11.

***TM 10-1670-251-12&P**

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), to: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

***This manual supersedes TM 10-1670-251-12 dated 20 April 1970.**

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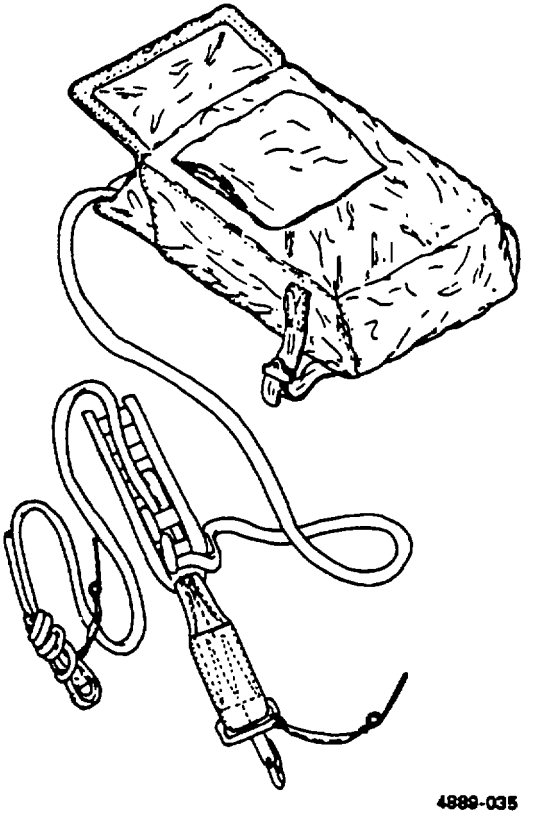


Figure 1-1. Personnel/Cargo 500 Lb Capacity Lowering Device.

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter supplies both general and specific information about the Personnel/Cargo Lowering Device and provides equipment characteristics, purpose, and basic principles of operation.

Section I. GENERAL INFORMATION

1-1. **Scope.** The scope of this manual is described in the following subparagraphs.

a. *Type of Manual.* This manual provides operator and unit maintenance of Lowering Device, Personnel/Cargo, NSN 1670-00-999-0758. The manual also provides a repair parts and special tools list located in appendix C.

b. *Equipment Name.* Lowering Device, Personnel/Cargo, 500 Lb Capacity hereinafter referred to as the lowering device.

c. *Purpose of Equipment.* The lowering device (figure 1-1) is used to lower either personnel or cargo from an elevated position of 150 ft or less, at a controllable rate of descent. It was designed for a parachutist to use during air drop operations where a high risk of tree landings is anticipated, and for lowering cargo or personnel from a hovering helicopter.

1-2. **Maintenance Forms and Records.** Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS) and DA PAM 738-751, The Army Maintenance Management System Aviation.

1-3. **Reporting of Equipment Improvement Recommendations (EIR).** If your lowering device needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put in on as SF368 Quality Deficiency Report (QDR). Mail it to us at: Commander, U.S. Army

Troop Support Command, ATTN: AMSTR-MOF, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send you a reply.

1-4. **Destruction of Army Materiel to Prevent Enemy Use**. Destruction methods are described in the following subparagraphs.

a. General.

(1) Objective. Methods of destruction used to inflict damage on air delivery equipment make it impossible to restore equipment to a usable condition in a combat zone by either repair or cannibalization.

(2) Authority. Destruction of air delivery equipment that is in imminent danger of capture by an enemy is a command decision that must be made by a battalion or higher commander or the equivalent.

(3) Implementation plan. All units which possess air delivery equipment should have a plan for the implementation of destruction procedures.

(4) Training. All personnel who use or perform such functions as rigging, packing, maintenance, or storage of air delivery equipment should receive thorough training on air delivery equipment destruction procedures and methods. The destruction methods demonstrated during training should be simulated. Upon completion of training, all applicable personnel should be thoroughly familiar with air

delivery equipment destruction methods and be capable of performing destruction without immediate reference to any publication.

(5) *Specific methods.* Specific methods of destroying Army materiel to prevent enemy use shall be by mechanical means, fire or by use of natural surroundings.

b. *Destruction by Mechanical Means.* Air delivery equipment metal assemblies, parts, and packing aids shall be destroyed using hammers, bolt cutters, files, hacksaws, drills, screwdrivers, crowbars, or other similar devices to smash, break, bend or cut.

WARNING

Exercise extreme care when using petroleum products to destroy equipment by fire, as severe burns or death could result.

c. *Destruction By Fire.* Items that can be destroyed by fire shall be burned. The destruction of equipment by use of fire is an effective method of destroying low-melting-point metal items (e. g. , side rails, threaded portions of nuts and bolts, and platform sheeting.) However, mechanical destruction should be completed first, whenever possible, before initiating destruction by fire. When items to be destroyed are made of metal, textile materials (or some comparable low combustible material) should be packed under and around the items, then soaked with a flammable petroleum product

and ignited. Proper concentration of equipment which is suitable for burning will provide a hotter and more destructive fire.

d. *Destruction By Use of Natural Surroundings.* Small vital parts of assemblies which are easily accessible may be disposed of as follows: Disposal or denial of equipment to an enemy may be accomplished through use of natural surroundings. Accessible vital parts of assemblies may be removed and scattered through dense foliage, buried in dirt or sand, or thrown into a lake, stream, or other body of water. Total submersion of equipment in a body of water will provide water damage as well as concealment. Salt water will inflict extensive damage to air deliver equipment.

1-5. **Preparation for Storage or Shipment.** For storage, refer to Chapter 3, Section V of this manual.

Section II. EQUIPMENT DESCRIPTION AND DATA

Paragraph Page

1-6. **Equipment Characteristics, Capabilities, and Features.** Characteristics, capabilities and features of the equipment are as follows:

a. *Characteristics.* Provides a capability to lower personnel or cargo from a helicopter.

b. *Capabilities and Features.*

(1) Capable of supporting up to 500 pounds.

(2) Controlled rate of descent.

(3) Lower from elevation of 150 ft or less.

(4) Used with a UH-1 helicopter.

(5) Components of the system.

(a) Carrying case

(b) Governor assembly

(c) Personnel harness

(d) 150-ft rope

(e) Rope snaphook

(f) Aircraft floor anchoring device tiedown assembly

1-7. **Location and Description of Major Components.** Locations and descriptions of major components are as follows (figure 1-2):

CARRYING CASE (1). Holds the rope, rope snaphook and governor assembly. Is provided with a hook and pile press-fit waist loop and leg strap.

GOVERNOR ASSEMBLY (2). Consists of the governor, governor snaphook, and governor web strap. Constructed of aluminum. ' Has five cylindrical rungs.

PERSONNEL HARNESS (3). Made from nylon webbing. Fits around wearers waist and legs. Primarily used In self-lowering.

ROPE (4). Made from double braided nylon 150 ft long and 3/8 In diameter. Feeds from carrying case.

ROPE SNAPHOOK (5). Constructed of steel. Provides attachment to either cargo or aircraft anchor point.

AIRCRAFT FLOOR ANCHORING DEVICE TIEDOWN ASSEMBLY (6). Consists of a main web loop with six snap fasteners. Between the snap fasteners are six D-rings.

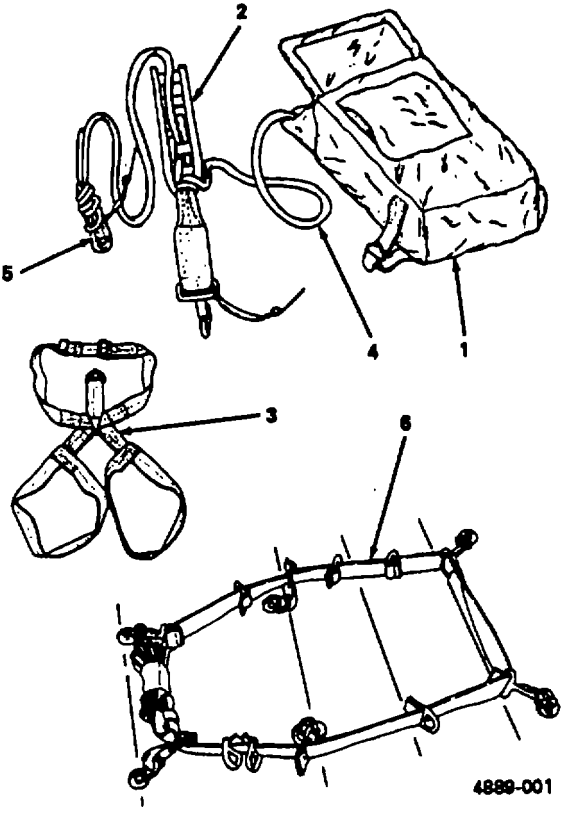


Figure 1-2. Personnel/Cargo Lowering Device Components.

1-8. Deleted (Change 1).

1-9. **Safety, Care and Handling**.

a. *Safety.* Its imperative that all safety precautions specified on the warning page In the front of the manual be observed. Also observe specific warnings and cautions specified throughout this manual. The warnings are provided for protection from death or serious injury.

b. *Care and Handling.*

(1) Protect the lowering device from the weather elements, dust, dirt, oil, grease, acids, and direct sunlight.

(2) Use a heated building to store lowering device when available. Store lowering device in a dry, well ventilated location, protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.

Section III. TECHNICAL PRINCIPLES OF OPERATION

1-10. **Principles of Operation.** The weight of the load determines the way the rope is laced around the rungs of the governor. The way the rope is laced also determines the control effort needed during the lowering. Between the rope and the rungs exist friction. As more rungs are laced, according to the loads, the friction between the rope and rungs increases. To control the descent, grip the rope

between the governor and the carrying case and at the governor web strap. To begin the descent release the rope at a constant rate. If control of the rope is lost, downward pressure applied to the top of the carrying case will stop or slow down the withdrawal of rope from the carrying case. This will allow time for the operator to regain control of the rope.

CHAPTER 2
OPERATING INSTRUCTIONS

OVERVIEW

This chapter describes, locates, illustrates, and furnishes the operator with information for the operation and preventive maintenance checks and services (PMCS) of the lowering device.

Section I. DESCRIPTION AND USE OF OPERATOR CONTROLS

2-1. **Operator Controls.** The governor provides a means of controlling the rate of descent. The weight of the load determines the way the rope will be laced around the rungs

of the governor. The way the rope is laced around the rungs also determines the control effort required. Four methods of lacing the governor have been established. For each method, there is a minimum weight required to move the rope through the governor for the different weight loads to be delivered.

a. *Methods of Lacing.*

NOTE

The selection of either a left hand or right hand lacing of the rope onto governor is at the option of the user.

When the rope is wet, additional friction is generated causing a slower rate of descent. When this condition occurs, use the next lower weight lacing method.

(1) Loads weighing 100 to 150 lbs. (figure 2-1). Pass the rope under the first rung (1) and second rung (2) and over the third rung (3). Reverse the direction of rope and pass it over second rung (2), under and around first rung (1) and then under second rung (2).

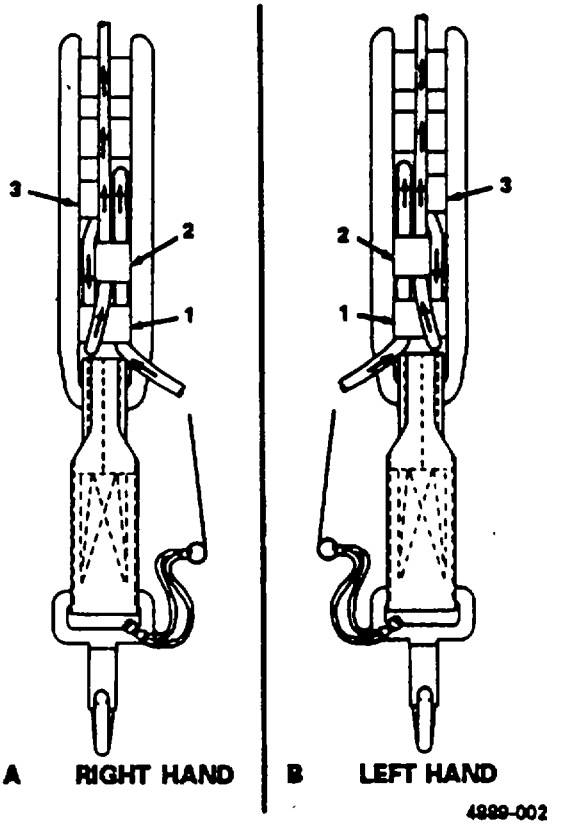


Figure 2-1. Lacing Method for Loads Weighing 100 to 150 Lbs.

(2) *Loads weighing 150 to 200 lbs.* (figure 2-2). Pass the rope under first rung (1) over second rung (2) under and around third rung (3). Reverse direction and pass rope under second rung (2) and around first rung (1). Over second rung (2) under third rung (3) and over fourth rung (4) and under fifth rung (5).

(3) *Loads weighing 200 to 300 lbs.* (figure 2-3). Pass rope under first rung (1) over second rung (2), under third rung (3) and around fourth rung (4). Reverse the direction and weave rope over third rung (3) under second rung (2) and around first rung (1). Reverse direction again and pass rope over second rung (2), under third rung (3) and over fourth rung (4).

(4) *Loads weighing 300 to 500 lbs.* (figure 2-4). Pass the rope under first rung (1), over second rung (2) under third rung (3) over fourth rung (4) and around fifth rung (5). Reverse direction of rope and weave under and over rungs to first rung (1) reverse direction again and pass rope over and under all rungs.

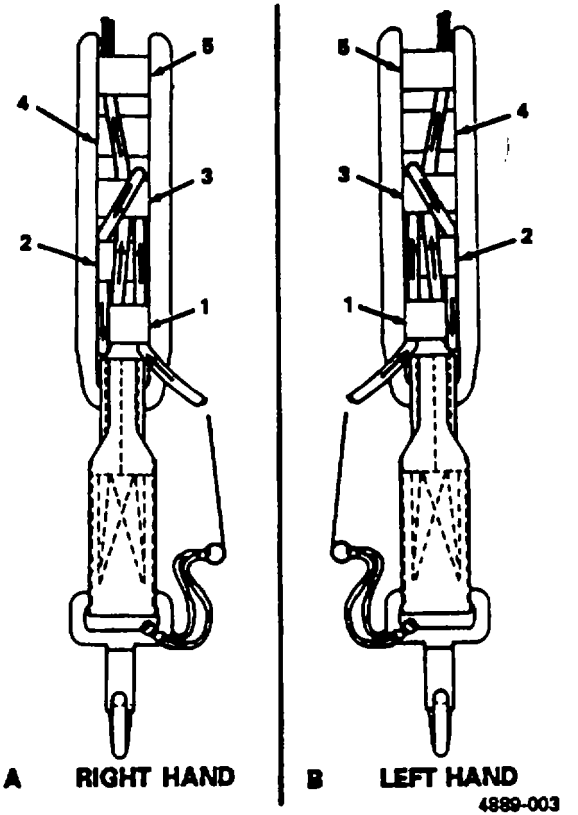


Figure 2-2. Lacing Method for Loads Weighing 150 to 200 Lbs.

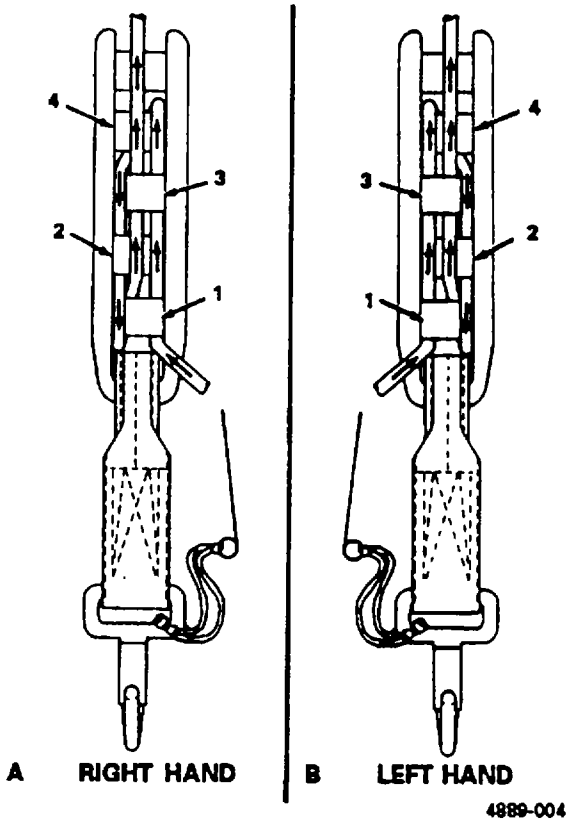


Figure 2-3. Lacing Method for Loads Weighing 200 to 300 Lbs.

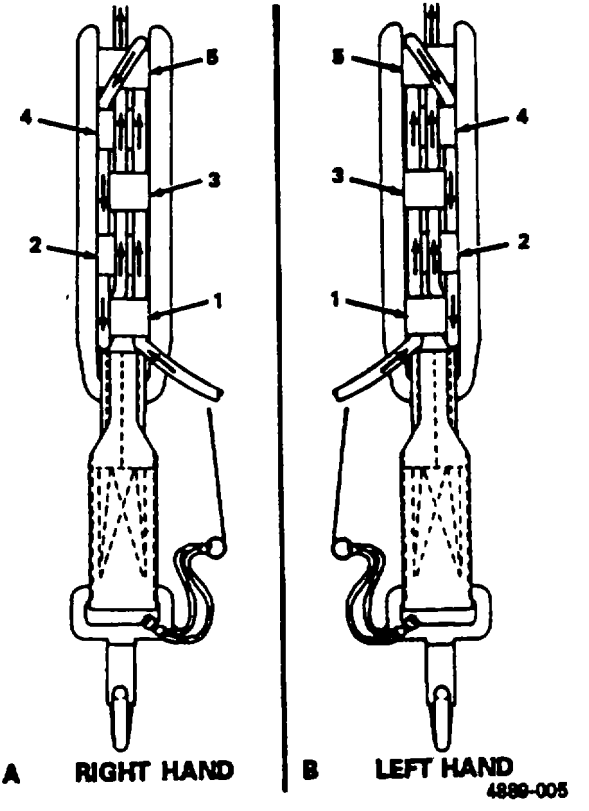


Figure 2-4. Lacing Method for Loads Weighing 300 to 500 Lbs.

Section II. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. **General.** Operator PMCS are performed to ensure that the lowering device is ready for operation at all times. Perform the checks and services at the specified intervals.

a. Before you operate, perform your before (B) PMCS. Observe all CAUTIONS and WARNINGS.

b. While you operate, perform your during (D) PMCS. Observe all CAUTIONS and WARNINGS.

c. After you operate, be sure to perform your after (A) PMCS.

d. If your equipment fails to operate, report defects to unit maintenance supervisor.

2-3. **Purpose of PMCS Table.** The purpose of the PMCS table is to provide a systematic method of inspection and servicing the equipment. In this way, small defects can

be detected early before they become a major problem causing the equipment to fail to complete its mission. The PMCS table is arranged with the individual PMCS procedures listed in sequence under assigned intervals. The most logical time (before, during, or after operation) to perform each procedure determines the interval to which It is assigned. Make a habit of doing the checks in the same order each time and anything wrong will be seen quickly. See paragraphs 2-4 and 2-5 for an explanation of the columns in table 2-1.

2-4. **Explanation of Columns.** The following is a list of the PMCS table column headings with a description of the information found In each column.

a. *Item No.* This column shows the sequence in which the checks and services are to be performed, and is used to identify the equipment area on the Equipment Inspection and Maintenance Worksheet, DA Form 2404.

b. *Interval.* This column shows when each check is to be done.

c. *Item to be Inspected/Procedures.* This column identifies the general area or specific part where the check or service is to be done, and explains how to do them.

d. *Equipment is Not Ready/Available if.* See paragraph 2-5.

2-5. **Equipment Is Not Ready/Available If Column.** This column lists conditions that make the equipment unavailable for use because it is unable to perform its mission, or because it would represent a safety hazard. Do not accept or operate equipment with a condition in the "Equipment is Not Ready/Available If" column.

NOTE

The terms ready/available and mission capable refer to the same status: Equipment is on hand and is able to perform its combat mission. Refer to DA Pam 738-750.

2-6. **Reporting Deficiencies.** If any problem with the equipment is discovered during PMCS or while it is being operated that cannot be corrected at the operator/crew maintenance level, it must be reported. Refer to DA Pam 738-750 and report the deficiency using the proper forms.

2-7. **Special Instructions.** Preventive maintenance is not limited to performing the checks and services listed in the PMCS table.

WARNING

The maximum number of times a rope shall be used Is 10 times. No rope shall be used to lower personnel after having been used for lowering any load exceeding 300 pounds.

NOTE

The log record card is supplied with the lowering device assembly. When a card is filled insure the inspection and use instructions on front of the old card are Included on the front of a new card.

a. *Keep it Clean.* Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Clean as you work and as needed. Use drycleaning solvent (tetrochlroethane) on all metal surfaces. Use soap and water to clean rubber or plastic material.

Table 2-1. Operator Preventive Maintenance Checks and Services (PMCS).

B - Before D - During A- After

Interval					
Item No.	B	D	A	Item to be Inspected	Equipment is Not Ready/Available If
1	•		•	LOWERING DEVICE Visually inspect for signs of damage or missing parts.	
2	•		•	CARRYING CASE a. Inspect for cuts, tears, snags, rips broken stitching b. Visually inspect for defective or missing parts, foreign material, dirt, and grease.	Leg strap, leg strap buckle, or loop Panel missing.
3	•		•	GOVERNOR ASSEMBLY a. Visually inspect for scored or panel roughened surfaces.	

Table 2-1. Operator Preventive Checks and Service (PMCS) (cont).

B - Before D - During A- After

Item No.	Interval B	Interval D	Interval A	Item to be Inspected Procedure	Equipment is Not Ready/Available If
3	•		•	GOVERNOR ASSEMBLY (cont)	
				b. Check for deteriorated web strap.	Stitching is broken or frayed webbing.
				c. Check snaphook. Notify unit maintenance.	Deformed, safety guard or pin missing.
	•		•	d. Cage rungs.	Check excessive rung wear.
4	•		•	HARNESS a. Inspect hardware for burrs, rust and cracks.	
				b. Inspect webbing for cuts snags, broken stitching or excessive wear.	Sticking is broken or cut/frayed webbing.

Table 2-1. Operator Preventive Maintenance Checks and Services (PMCS) (cont).

B - Before D - During A- After

Item No.	Interval B	D	A	Item to be Inspected	Equipment is Not Ready/Available If
5	•		•	ROPE Inspect for cuts, frays, abrasions, melted material and length, number of lowerings.	Rope measures less 150 it or has been used 10 times.
6	•		•	ROPE SNAPHOOK Check for operation, missing parts, rust, burrs and foreign material.	Deformed safety guard or pin missing.
7	•		•	ANCHORING DEVICE ASSEMBLY, AIRCRAFT a. Inspect for cut or frayed webbing, loose or broken stitching.	

Table 2-1. Operator Preventive Maintenance Checks and Services (PMCS) (cont).

B - Before D - During A- After

Interval					
Item No.	B	D	A	Item to be Inspected	Equipment is Not Ready/Available If
7	•		•	ANCHORING DEVICE ASSEMBLY, AIRCRAFT (cont)	
				b. Inspect safety snap for deformation and missing parts.	Inoperative safety snap mechanism. Missing safety pin.
				c. Inspect D-ring for bends, burrs or cracks.	Deformed.
				d. Inspect friction adapter.	Adapter deformed or inoperative.
8	•		•	LOG RECORD CARD. Check for missing, completely filled or damaged card.	

Section III. OPERATION UNDER USUAL CONDITIONS

2-8. **General.** This section includes instructions for assembly and preparation of the lowering device for use. Also, operating the lowering device to lower cargo from a helicopter and a parachutists from a tree.

2-9. **Assembly and Preparation for Use.** (figures 2-5 thru 2-7). The following assembly procedure applies to personnel and cargo. The assembly and preparation of the lowering device is to be completed prior to use.

a. Tie a figure eight knot (1) at the end of the rope (2) (figure 2-5).

NOTE

Carefully follow instructions for placing the rope in the carrying case to ensure the rope will not become tangled or knotted.

When assembling components, avoid unnecessary rubbing, fraying, cutting or dislocation of the rope.

b. Remove twists or tangles In the rope (2).

c. Place knotted end of rope (2) Into carrying case.

d. Stow, all but 9 ft of rope in carrying case in random folds.

e. Lace governor based on weight of personnel or cargo to be lowered. Refer to paragraph 2-1.

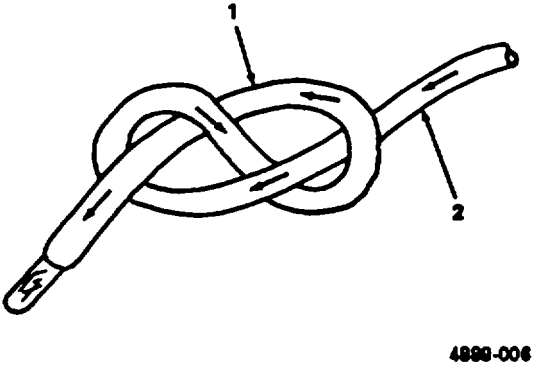


Figure 2-5. Figure Eight Safety Knot.

f. Attach snaphook to ropes as follows:

(1) Pull four feet of rope (2) beyond end of governor.

(2) Grasp the rope (2) 2 ft from end, and double it (forming a bight).

(3) With snaphook (4) facing left, pass 18 in of the folded (running) end down through eye of snaphook (4).

(4) Wrap running end (5) from left to right, around free end twice (A, figure 2-6).

(5) Pass running end (5) beneath first wrap (6) (closest to snap) from left to right (B, figure 2-6).

(6) Pass running end (5) through loop (7) formed by eye of snaphook and first fold (C, figure 2-6).

(7) Pass running end (5) loop over snaphook (4) (D, figure 2-6).

(8) Hold snaphook (4) and free end of rope, pull to tighten knot.

g. Hook the rope (2) on one of the safety stops (8) located on either side of the governor (3) (figure 2-7).

h. Stow governor (3), snaphooks (4) and remaining rope (2) in carrying case.

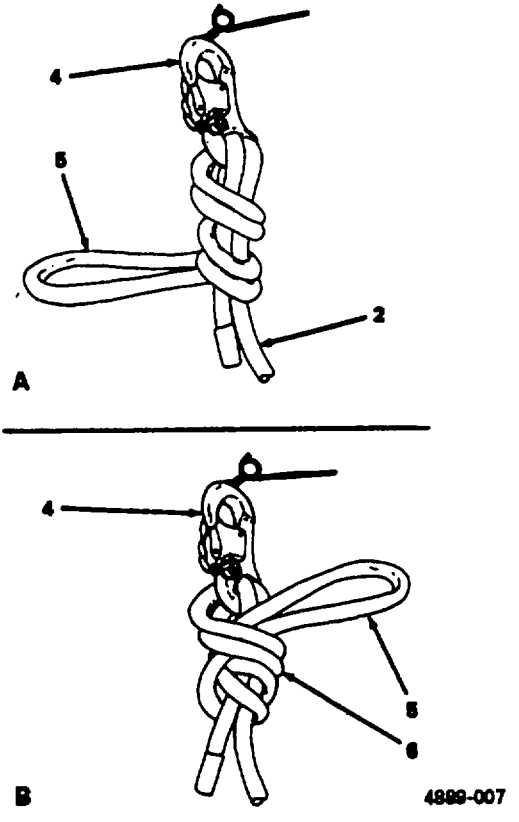


Figure 2-6. Attaching Rope to Snaphook (Sheet 1 of 2).

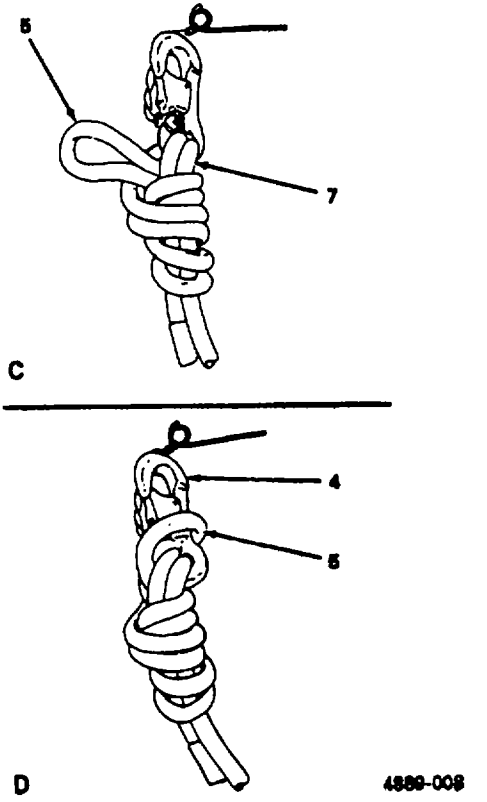


Figure 2-6. Attaching Rope to Snaphook (Sheet 2 of 2).

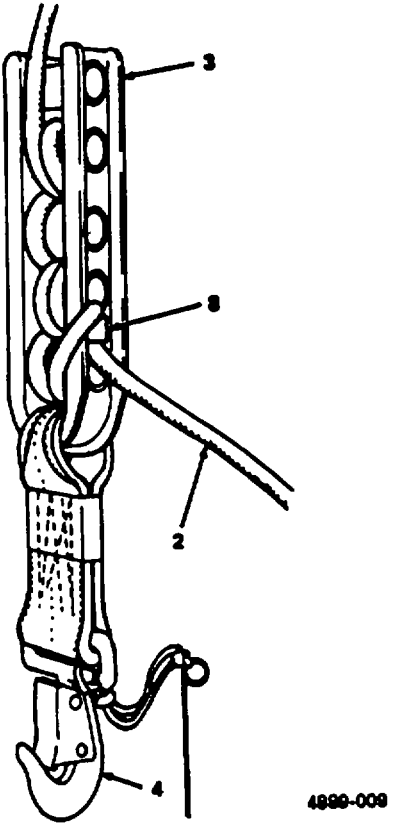


Figure 2-7. Rope in Safety Stop.

2-10. **Lowering Cargo from a Hovering Helicopter.**

NOTE

During lowering operation, keep controlled tension on rope. Do not make sudden starts or stops. Apply tension gradually to slow the descent of personnel or cargo.

a. *Lowering Device Setup for Cargo.* (figure 2-8)

(1) Assemble lowering device, refer to paragraph 2-9.

(2) Attach governor snaphook (1) to the anchor point (2) in the helicopter.

(3) Insert safety pin (3) into governor snaphook (1).

(4) Attach rope snaphook (4) to cargo (5) and insert safety pin (6).

NOTE

Add additional padding to floor edge, as required, to prevent damage to rope caused by feeding rope over floor edge.

(5) Hang the governor (7) outside the door.

(6) Place carrying case (8) near door.

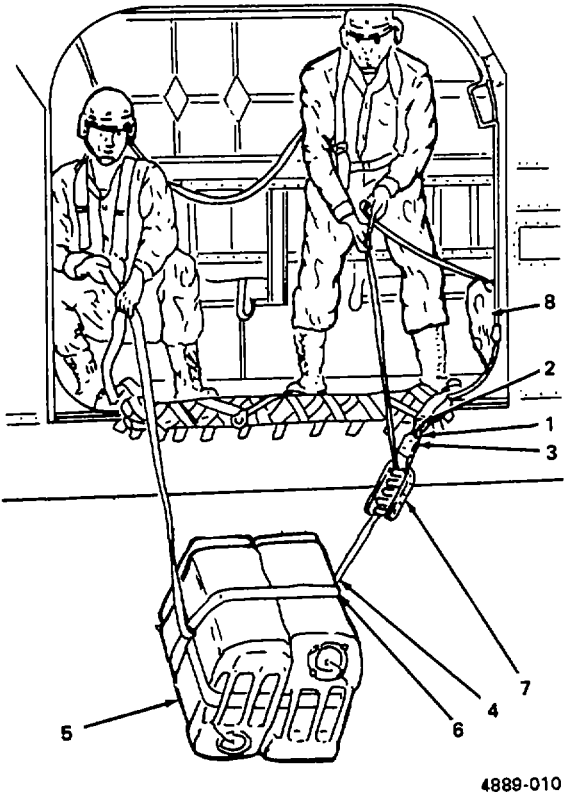


Figure 2-8. Lowering Device Setup for Cargo.

(7) Secure the carrying case (8) to helicopter with waist loop.

b. *Lowering Procedure*. (figure 2-9). Two methods have been established for releasing cargo bundles from helicopter. The two methods are as follows:

NOTE

Method number one is recommended for light loads (100 to 250 pounds) that can be easily carried within the cargo compartment of utility of cargo helicopters. It may also be used with heavier loads from cargo helicopters equipped with overhead anchor points and material handling equipment.

(1) *Method one*. Method number one is used to lower internally carried cargo.
(a) Move the cargo (1) to the door.
(b) Grasp the running end of the rope (2) at governor (3).

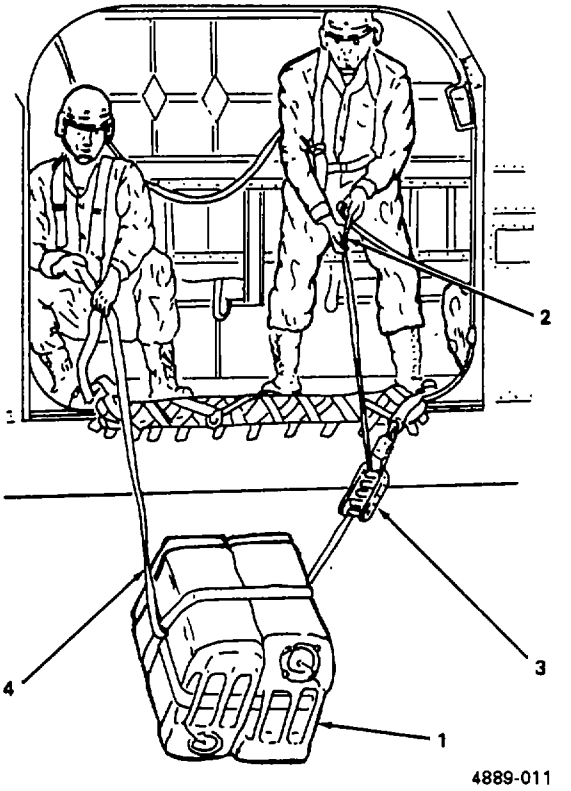


Figure 2-9. Method One Lowering.

NOTE

Two or three persons may be required to start cargo exit, depending on weight of load.

(c) Attach a 15 ft tiedown strap (4) to cargo opposite the governor (3).

(d) Place cargo (1) out of helicopter.

(e) When the cargo (1) has cleared the helicopter, release the tiedown strap (4).

(2) *Method two*. Method number two is used to lower externally slung cargo.

NOTE

Externally slung loads require that a portion of the rope between the carrying case and the governor (loose part) be tied around the governor web strap.

(a) Tying knot. (figure 2-10)

1 Take a 3-foot bight in the rope from the point from which it leaves the governor (A, figure 2-10).

2 Wrap a double turn of the rope around the governor web strap, insuring the rope goes behind the governor web strap (B and C, figure 2-10).

3 Tie a slip knot around the single rope which leads out from carrying case (D, figure 2-10).

4 Make a half-hitch in the sliding (double loop of the slip knot) (E, figure 2-10).

(b) Untying knot.

1 Pull the single loop of the slip knot and the knot will free itself (F, figure 2-10).

2 Unstrap the turns around the governor web strap, maintaining manual restraint on the rope.

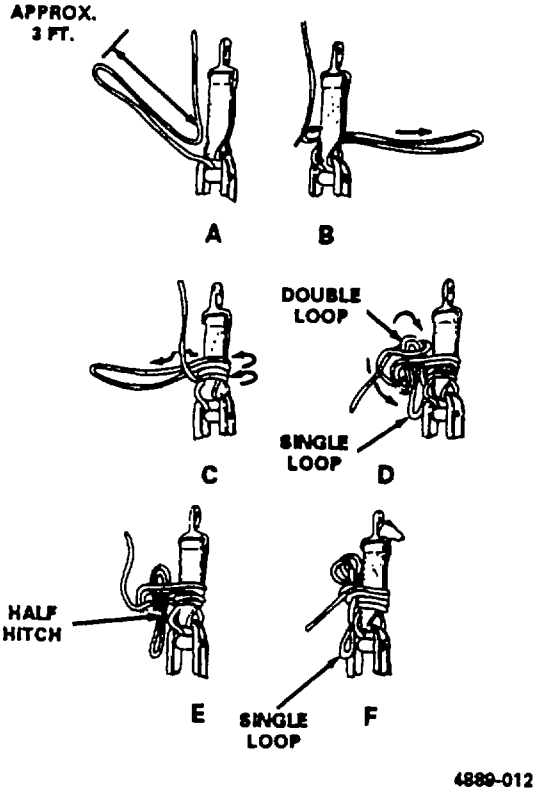


Figure 2-10. Tying/Untying a Round Turn and Haff-Hitch Slip Knot.

(c) Lowering cargo. (figure 2-11)

1 Grasp the running end of the rope at a point where it enters the governor.

2 Release the rope from the safety stop, and lower the cargo bundle to the ground.

NOTE

Observe that the governor hangs outside the helicopter, but is accessible to personnel located inside. When using the UH-1 helicopter with this method, the rope should run from within the helicopter, through the governor, between the landing skids, and to the cargo bundle.

(3) *Controlling descent of cargo bundles.*

(a) For cargo loads less than 300 pounds, control descent by relaxing or increasing grip on the rope.

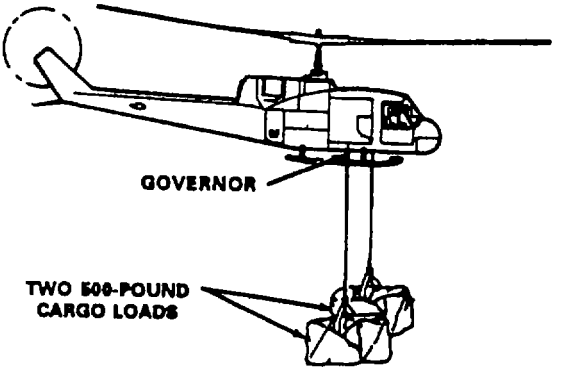


Figure 2-11. Lowering Cargo from Helicopter.

(b) For cargo loads over 300 pounds, maintain continuous manual restraint on the rope.

WARNING

For cargo loads over 400 pounds, the operator should wear leather gloves.

2-11. **Lowering Parachutist from Trees.**

a. *Lower Procedure.* (figures 2-12 through 2-14)

NOTE

Assembly of the lowering device is done prior to making a jump.

(1) Attach governor snaphook (1) to parachutist harness (2) and Insert safety pin (3).

NOTE

If one riser appears to support most of the weight, use it as the anchor point.

(2) Pass rope snaphook (4) through "V" formed in riser (5).

(3) Fasten rope snaphook (4) onto rope (6) to form a loop around riser (5).

(4) Insert safety pin (7) in rope snaphook (4).

(5) Hook rope (6) onto safety stop (8) of governor (9).

(6) Pull down on riser (5) and open canopy release (10). Allow body weight to transfer to one riser.

(7) Pull down on remaining riser (11) and open canopy release (12).

(8) Gradually transfer body weight to the governor (9).

NOTE

Keep rope taut to prevent involuntary lowering.

(9) When position is stabilized, release rope (6) from safety stop (8).

(10) Slowly allow rope (6) to feed through governor (9) and begin descent.

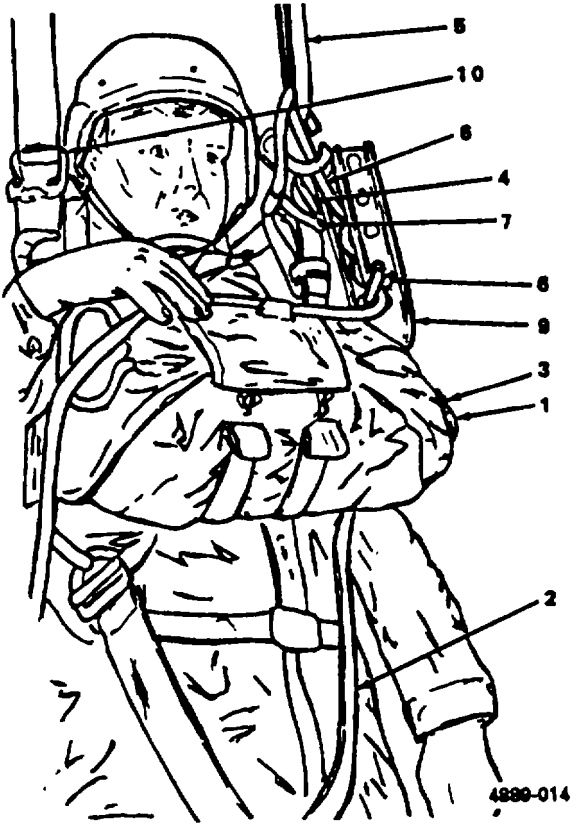


Figure 2-12. Parachutist Releasing First Riser.

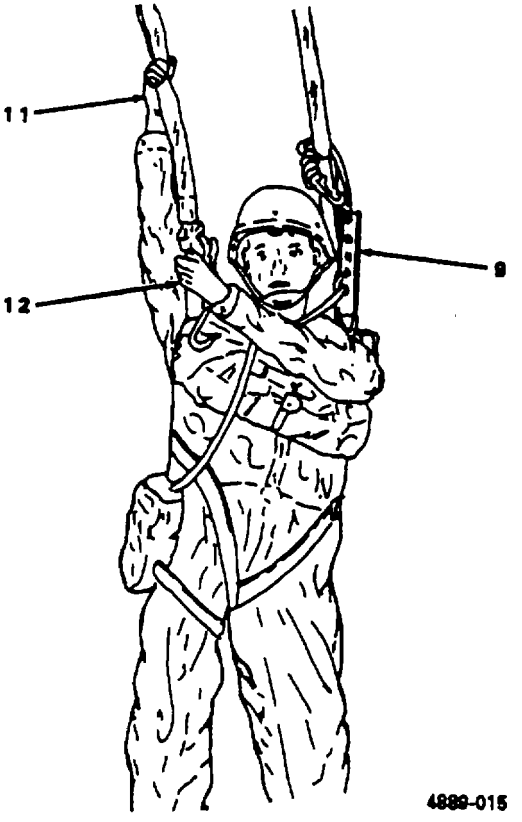


Figure 2-13. Parachutist Releasing Second Riser.

Figure 2-14. Parachutist Descending.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS.

2-12. **Lowering Personnel from a Hovering Helicopter**. (figure 2-15)

a. *Preparation for Exit.*

(1) Assemble lowering device, refer to paragraph 2-9.

(2) Put on personnel harness.

b. Exiting the Helicopter. The following method has been established for exiting the helicopter.

NOTE

Pad all sharp edges that the rope will pass over.

The overhead anchor point may be used, if available.

(1) Attach rope snaphook (1) to anchor point.

(2) Move to door of helicopter.

(3) Sit facing outboard with feet hanging over the edge.

(4) On the signal to exit the helicopter, place feet on (UH-1 helicopter).

(5) Standing turn and face the helicopter.

WARNING

To avoid free falling and possible injury, keep continuous contact on rope.

(6) Remove rope (1) from safety stop (2).

(7) Allow rope (1) to pass through governor (3).

(8) Assume the U-body position, keeping feet in contact
with edge of cargo compartment.

(9) When your head is below the skid of cargo helicopter, drop feet away.

NOTE

The rate of descent can be adjusted by either tightening or relaxing the grip on the rope.

NOTE

If the lowering distance is greater than the length of rope; signal pilot to lower helicopter.

(10) Assume an upright position and at the same begin to feed rope (1) through governor (3) to begin discent.

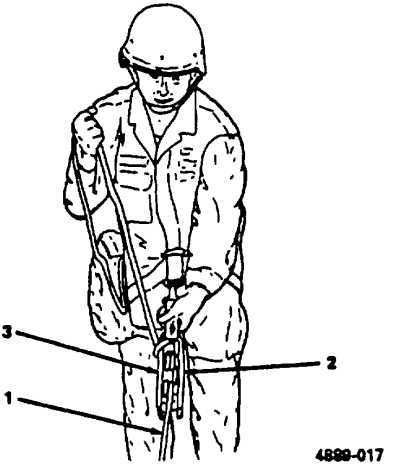


Figure 2-15. Rappelling from Helicopter.

c. Reaching Ground Level.

(1) Upon reaching the ground, adopt a squatting position, pull the safety pin from the governor snaphook, then stand up.

(2) Disconnect the governor snaphook from the V-ring on the personnel harness.

(3) If the lowering device is to be drawn back Into the helicopter, remove the personnel harness and attach the governor snaphook to the V-ring of the personnel harness.

(4) If the lowering device is not to be drawn back into the helicopter, signal for the rope snaphook to be released from the anchor point within the helicopter.

Section V. OPERATION WHEN USED WITH UH-1 HELICOPTER

2-13. Installation Procedure.

a. *Personnel Use*. (figure 2-16). Install the tiedown assembly, aircraft floor anchoring device as follows:

(1) Secure the tiedown assembly, aircraft foor anchoring device (1) at corner snaphooks (2). Two forward and two aft.

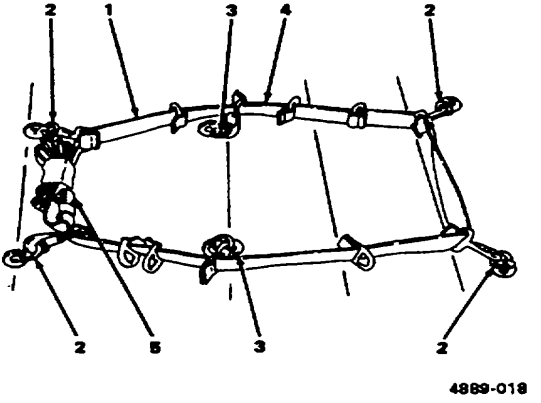


Figure 2-16. Tiedown Assembly, Aircraft Floor Anchoring Device Installed for Personnel Use.

(2) The two middle snaphooks (3) are secured inside the web loop (4).

(3) Tighten web loop (4) to remove slack at the friction adapter (5). Fold and tape excess webbing.

b. Cargo Use. (figure 2-17). Installing the tiedown assembly, floor anchoring device for cargo use is the same as personnel use with the following additions.

NOTE

As many as six extension webs may be used. The installation is the same for all.

(1) Attach web extension (1) to D-ring (2).

(2) Insert safety pin (3) into snaphook (4).

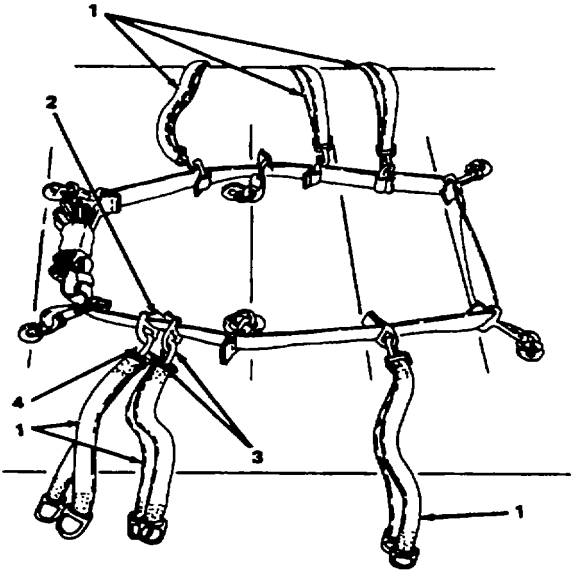


Figure 2-17. Tiedown Assembly, Aicraft Floor Anchoring Device Installed for Cargo Use.

2-14. Lowering Procedure.

NOTE

- **The total number of lowering devices being used at the same time on each side of the helicopter shall not exceed three. The total number of lowering devices used simultaneously on both sides of the helicopter shall not exceed six.**

- **When two or more users are exiting the helicopter, they will exit the helicopter one after the other, rather than to have all individual exit at the same time.**

- **At NO time shall the number of lowering devices in use on one side of the helicopter differ by more than one from the number of lowering devices in use on the opposite side of the helicopter.**

a. *Personnel Use*. (figure 2-18)

(1) Secure rope snaphook (1) to D-ring (2) of tiedown assembly, aircraft floor anchoring device (3).

(2) Insert safety pin (4) into rope snaphook (1).

(3) Run rope (5) through governor (6) an equal distance from the anchor point to the door.

(4) Exit helicopter according to procedure In paragraph 2-1 2b.

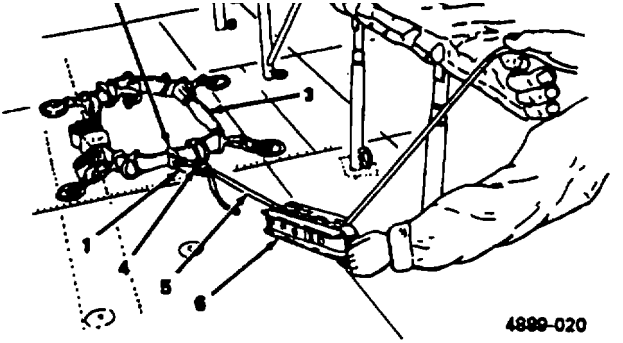


Figure 2-18. Tiedown Assembly, Prepared for Personnel Use.

Figure 2-18. Tiedown Assembly, Prepared for Personnel Use.

b. *Cargo Use*. (figure 2-19)

NOTE

- **No more than two cargo loads will be lowered at a time. One from each side of helicopter.**
- **Cargo loads of 300 lb to 500 lb will be lowered at a constant rate not to exceed 8 feet per second. Avoid abrupt stops.**

(1) Attach governor snaphook (1) to D-ring (2).

(2) Insert safety pin (3) in governor snaphook (1).

(3) Adjust the length of the web extension (4) to allow governor (5) to hang just outside door. Fold and tape excess webbing.

(4) Secure carrying case (6) to helicopter seat (7).

(5) Gradually release rope (8) to begin cargo descent.

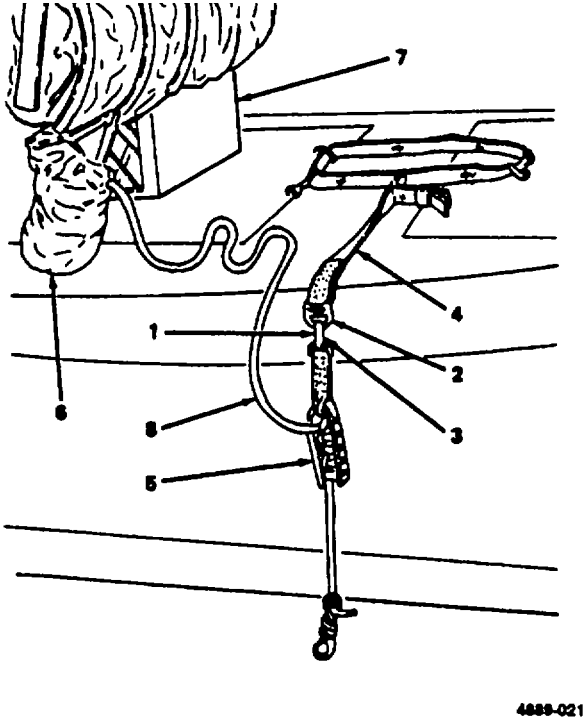


Figure 2-19. Tiedown Assembly, Prepared for Cargo Use.

Figure 2-19. Tiedown Assembly, Prepared for Cargo Use.

CHAPTER 3
UNIT MAINTENANCE INSTRUCTION

OVERVIEW

This chapter contains Information necessary to maintain the Lowering Device at the unit level in accordance with the Maintenance Allocation Chart for equipment.

Section I. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

3-1. **Common Tools and Equipment**. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit and Appendix B, Section III of this manual.

3-2. **Special Tools, TMDE and Support Equipment**. For a listing of special tools, TMDE, and support equipment authorized for use on this equipment, refer to the Repair Parts and Special Tools List, Appendix C, and the maintenance allocation chart (MAC), appendix B of this manual.

3-3. **Repair Parts**. Repair parts are listed and illustrated in Appendix C of this manual.

Section II. SERVICE UPON RECEIPT

3-4. **Initial Receipt**. The following describes the procedures for processing lowering device upon initial receipt..

a *General Procedures* for the Lowering Device. When air delivery equipment is initially procured from a supply source and issued to a using unit, the item(s) will be unpacked from the shipping container(s) and inspected by qualified personnel. The inspection performed will be a technical/rigger-type which will be conducted as outlined In paragraph 3-8. Upon Completion of the inspection, the

item(s) will be tagged as prescribed in DA PAM 738-751. Serviceable equipment may then be entered either into storage or into use in air delivery operations, as applicable. An unserviceable item will be held and reported in accordance with DA PAM 738-750.

b. Inspection Personnel. Personnel other than parachute rigger personnel may assist in the unpacking process of initially received aerial delivery equipment as directed by the local air delivery equipment maintenance officer. However, the maintenance officer will ensure that the entire unpacking effort is conducted under the direct supervision of a qualified rigger (MOS 43E).

c. Configuration/Condition. Acceptance of new equipment from the manufacturer is based upon inspections made of sample lots which have been randomly selected in accordance with military standards. It is incumbent upon the using activity personnel to bear this in mind whenever equipment is first placed in service. Changes will sometimes evolve from the original equipment design and sometimes contractors are authorized deviations in material and construction techniques. Air delivery equipment that has been in the field cannot be expected to meet exacting manufacturing specifications; however, the equipment should closely reflect desired design characteristics. Since repairs, modifications, and/or changes can alter or detract from the configuration originally desired, such equipment shall be airworthy, safe, of the desired configuration, and adequate for intended use.

NOTE

When a log record is lost the rope will be replaced and a new log record initiated.

d. *Log Record*. The Army Log Record DA Form 3603-R is a history-type maintenance document which accompanies the lowering device assembly through the period of service of the individual assembly. The log record provides a means of recording maintenance actions performed on a lowering device assembly. Normally, a log record is initiated and placed in the pocket of the carrying case, however, if the item is subjected to alteration or modification by a maintenance activity during the interim period from date of manufacture to receipt by a using unit, the log record will be prepared by the activity performing the maintenance function. Once initiated, a log record will be prepared by the activity performing the maintenance function. Once initiated, a log record will be attached to and contained in an affixed record/inspection data pocket until such time as the lowering device assembly is destroyed or rendered unfit for further use or repair. Additionally, should an item that requires a log record be transferred from one unit to another, the log record for the lowering device assembly will accompany the item in the transfer action. A prepared log record will not be removed or separated from a lowering device, and especially a packed lowering device, except as directed by the local air delivery equipment maintenance activity officer. A log record which is illegible, damaged, soiled, or precludes further entries due to lack of space will be replaced upon the next repack or inspection, as applicable, with a serviceable item from stock (figure 3-1).

LOG RECORD FOR INSPECTION AND USE OF LOWERING DEVICE, PERSONNEL/CARGO UTILITY, 500-POUND CAPACITY

For use of this form, see TM 10-1670-251-12; the proponent agency is US Army Material Command.

INSPECTION AND USE INSTRUCTIONS

1. Governor Serial No.: Enter Serial Number specified on control.
2. Date: Enter day, month and year of inspection.
3. Governor Inspection: Enter OK if satisfactory for reuse.
4. Rope Inspection: Enter OK if satisfactory for reuse.
5. Remarks: Maintenance performed and/or use restrictions
6. Inspected by: Enter name of individual performing inspection.
7. Unit: Enter inspector's unit.
8. Rope Uses Entry to be made by user When used initially enter number 1 in upper portion of block and the date in the lower portion. For subsequent uses enter next higher number. For personnel lowering add "P" before the number; for cargo lowering add "C". Maximum uses for one rope is 10. When a new rope is installed start with number 1 again. A rope used for lowering cargo weighing more than 300 lbs will not be used for personnel loweringa. When a cargo lowering in excess of 300 lbs is made enter in the remarks block "Use For Cargo Only" in the next line entry column. Until rope is replaced enter "Use For Cargo Only" in subsequent fine entry columns for each use.

1. GOVERNOR SERIAL NUMBER

2. DATE			3. GOV INSP	4. ROPE INSP	5. REMARKS	6. INSP BY	7. UNIT	8. ROPE USES
DAY	MO	YR						
25	07	89	OK	OK		[illegible]	[illegible]	P1 [illegible]
26	07	89	OK	OK		"	"	C-2 [illegible]
27	07	89	OK	OK	use for Cargo Only	"	"	—

DA Form 3603-R, 1 May 70 4889-022

Figure 3-1. Log Record Card.

Section III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-5. **General**. Unit level maintenance PMCS are done to ensure that the lowering device is in top operating condition. A comprehensive PMCS program reduces equipment downtime and increases the operational readiness of the lowering device.

3-6. **PMCS Procedures**. Unit level PMCS is contained in table 3-1. The numbers in the Item No. column show the order in which the check or service should be done. These numbers should be used when recording deficiencies and shortcomings on DA Form 2404, Equipment Inspection and Maintenance Worksheet. The dot (v) in the Interval column indicates when a check or service should be done, as follows:

Table 3-1. Unit Preventive Maintenance Checks and Services (PMCS)

S - Semiannually

Item No.	Interval S	Item to be Inspected	Procedures
1	•	Governor	Inspect for rung wear. Refer to para. 3-12
2	•	Personnel Harness	Visually inspect for cuts, snags, broken stitching; replace if damaged beyond repair.
3	•	Tiedown Assembly	Visually inspect for cuts, snags broken stitching; replace if damaged beyond repair.

Section IV. UNIT MAINTENANCE PROCEDURES

3-7. **General Information**. The following paragraphs contain general information pertinent to unit maintenance procedures. This section contains maintenance procedures which are the responsibility of the specified technician as authorized by the Maintenance Allocation Chart (MAC) and the Source, Maintenance and Recoverability (SMR) coded items that are identified in the repair parts and special tools list (RPSTL). Each paragraph identifies a maintenance function specified in the MAC. All maintenance procedures required to complete a maintenance function are identified under "This task covers: ", in the order in which the work is most logically accomplished.

3-8. **Inspection**. Before using a lowering device, Inspect all metalware for proper operation, rust, corrosion, cracks, bends, distortion, burrs, sharp edges, grease, oil, acid, or foreign matter. Check for any missing components. If bends, cracks, or distortions are present, the lowering device cannot be used. If any of the maximum criteria is exceeded, on any of the components that must be replaced. Do not be alarmed if fuzziness appears on the rope. This is one of the characteristics of nylon and does not affect the strength of the rope. Refer to the Maintenance Allocation Chart (MAC) when replacing components.

3-9. Repair - Sewing Procedures.

This task covers: a. Stitching and Restitching
b. Darning

Tools:

Specified in paragraph applicable to the item being repaired.

Equipment Condition:

Unpacked. Lowering device with defects recorded and clean.

Materials/Parts:

Specified in paragraph applicable to the item being repaired.

3-9. Repair - Sewing Procedures (cont).

NOTE

Sewing requirements will vary according to the type of item being repaired and the type of repair being made. The type of sewing machine, type of thread, the stitch range, and the stitch pattern, if applicable, required to accomplish a sewing procedure will be specified in the paragraph applicable to the item being repaired. All original stitching that is cut during the performance of a sewing procedure will be removed from the applicable item. Immediately after the accomplishment of a machine sewing procedure, trim thread ends to a point as close as possible to the material which has been sewn.

a. *Stitching and Restitching*. Perform stitching and restitching as follows, referring to table 3-2:

(1) *Lowering device assemblies*. The stitching and restitching made on lowering device should be accomplished with thread that is contrasting in color to the fabric being restitched. if contrasting color thread is not available, thread of matching color may be used, providing all other specifications are met. Straight stitching and restitching on lowering device assemblies should be locked by at least 2 inches at

each end of a stitch row, when possible. (Zig-zag stitching does not require locking; however, zig-zag restitching should extend at least 1/4 inch into undamaged stitching at each end, when possible. When restitching lowering device assemblies, stitch directly over the original stitching and follow the original stitch pattern as closely as possible.)

Table 3-2. Sewing Machine Code Symbols.

Code Symbol	Sewing Machine
LD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; light duty; NSN 3530-01-177-8590.
MD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-zag; 308 stitch; medium duty; NSN 3530-01-181-1420.
LD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-zag; 308 stitch, light duty; NSN 3530-01-181-1420.
HD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; heavy duty, NSN 3530-01-177-8588.
MD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; medium duty, NSN 3530-01-177-8591.
DN	SEWING MACHINE, INDUSTRIAL: Darning; lock stitch; NSN 3530-01-177-8589.
LHD	SEWING MACHINE, INDUSTRIAL: 301 stitch; light heavy duty; NSN 3530-01-186-3079.
ND	SEWING MACHINE, INDUSTRIAL: 301 stitch. double-needle; NSN 3530-01-182-2873.

3-9. Repair - Sewing Procedures (cont).

b. Darning. (Refer to table 3-2.) Darning is a sewing procedure used to repair limited size holes, rips, and tears in assorted airdrop items constructed from textile material such as parachute canopy gore sections and the cloth and reinforcement webbing of packs. A darning repair may be made either by hand or sewing machine, depending upon the method preferred and the availability of equipment. However, a darning machine should be used to darn small holes and. tears where fabric is missing. Darning of previously patched material can be performed provided darning size limitations prescribed in the paragraph applicable to the item are not exceeded. A darning repair will be performed using the following procedures, as appropriate:

Machine darning. Proceed as follows:

(a) Using an authorized marking aid of contrasting color, mark a square around the damaged area and ensure that the marking is at least 1/4 inch back from each edge of the damaged area. The marking will be made with the warp and the filling of the material.

(b) Darn the damaged area by sewing the material in a back-and-forth manner, using size A or E nylon thread, allowing the stitching to run with the warp or filling of the fabric (A, figure 3-2).

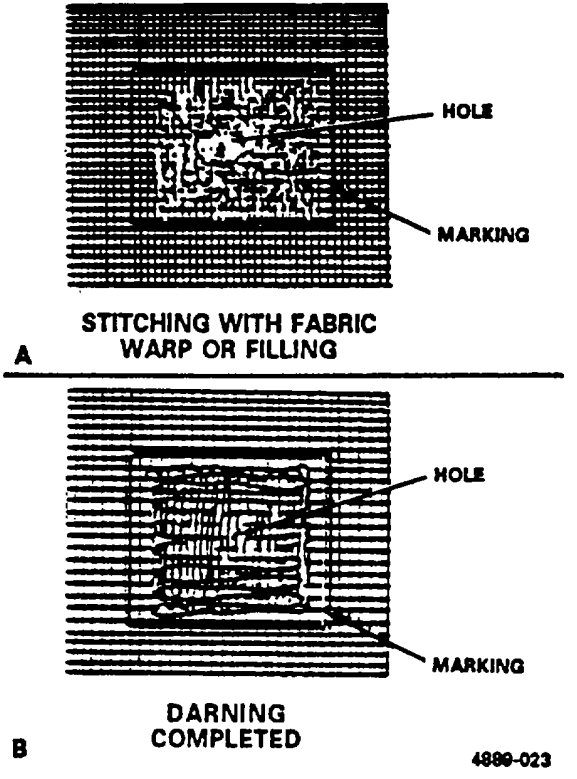


Figure 3-2. Darning Method Using a Darning Sewing Machine.

3-9. Repair - Sewing Procedures (cont).

(c) Turn the material and stitch back and forth across the stitching made in (b) above until the hole or tear is completely darned (B, figure 3-2).

(d) If applicable restencil Information data, gore number(s), or identification marks using the criteria in para. 3-11.

3-10. Searing.

This task covers: Searing

Tools:
Knife; Metal, Hot,
Item 3, Appendix B

Equipment Condition:
Unpacked.

NOTE

Cotton tape, webbing, or cord will not be seared. Fabric materials such as cord, tape, and webbing that are cut for use in the maintenance of air delivery equipment will normally be heat-seared or dipped in a melted wax mixture, as applicable, to prevent the material from fraying or unraveling. However, in some instances the preparation of the material may not be necessary and will be specified accordingly.

Searing. The cut ends of nylon tape, webbing, and cord lengths may be prepared by heat-searing which is performed by pressing the raw end of the material against a hot metal surface (knife) until the nylon has melted sufficiently. Avoid forming a sharp edge or lumped effect on the melted end.

3-11. Marking and Restenciling.

This task covers:
a. Marking
b. Restenciling
c. Remarking and Restenciling

Tools:

Brush, Stenciling, Item 1, Appendix B

Materials/Parts:

Ink, Marking, Item 3, Appendix D
Marker, Felt Tip, Black, Item 4, Appendix D
Pen, Ball Point, Item 5, Appendix D
Stencilboard, Oiled, Item 7, Appendix D

Materials/Parts (cont):

Equipment Condition:

Layout on packing table or other suitable area.

NOTE

Stenciling should be used whenever possible. A ballpoint pen or felt tip marker should be used only where stenciling is not possible, or when stenciling devices are not available. However, only felt tip markers that contain parachute marking ink and marked "FOR PARACHUTE MARKING" are authorized for use in marking airdrop items. Any type ball point

pen using black or blue Ink may be used for marking on labels only.

Original stenciled data or marking that becomes faded, illegible, obliterated, or are removed as a result of performing a repair procedure will be remarked with a ballpoint pen, felt tip marker, or restenciled. All marking or restenciling will be done on, or as near as possible to, the original location and should conform to the original lettering type and size.

a. *Marking*. Using marking devices, such as ballpoint pen or felt tip marker, mark on, or as near as possible to, original location and conform to original lettering type and size.

b. *Restenciling*. Proceed as follows:

(1) Cut oiled stencilboard to original lettering type and size of data to be restenciled.

(2) Place cut stencilboard over, or as near as possible to, original marking to be restenciled.

3-11. Marking and Restencillng (cont).

(3) Place additional sheet of stencilboard beneath the area to be restenciled to prevent the marking ink from penetrating to other areas.

(4) Hold stencilboard in place and, using stenciling brush filled with parachute marking ink, restencil original marking.

c. *Remarking and Restenciling*. Remark or restencil original stenciled data or markings that become faded, illegible, obliterated or have been removed as a result of performing a repair procedure. Ensure all marking or restenciling is on, or as near as possible to, the original location and conforms to the original lettering type and size.

3-12. Carrying Case.

This task covers:
a. Inspect
b. Repair
b. Replace

Tools:

Shears, Item 6, Appendix B

Needle, Item 4, Appendix B
Sewing Machine, Medium Duty, Item 7, Appendix B
Sewing Machine, Darning, Item 8, Appendix B

Materials/Parts:

Thread, Size E, Items 8/9, Appendix D

Materials/Parts (cont):

Webbing, Nylon, Type IV, Item 1. Appendix D

Equipment Condition:

Equipment removed from case.

a. *Inspect*. Inspect for tears, cuts and broken or missing stitching.

b. *Repair*.

(1) Restitching. Restitch carrying case, using a medium duty sewing machine and size E nylon thread of contrasting color. Stitch over original pattern, 7 to 11 stitches per inch. Lock each row of stitches 1/2-inch at each end.

3-12. Carrying Case (cont).

(2) Darning. Darn a hole or tear that does not exceed 3/4 inch in diameter or length as prescribed in para. 3-9, using size E nylon thread.

(3) *Replacing leg straps*. (figure 3-3)

(a) Remove original leg straps (1) from carrying case (2) by cutting stitching. Retain buckle (3) for future use.

(b) Cut a 26-inch and a 6 1/2-inch lengths of 1-inch wide, type IV, nylon webbing and sear ends.

(c) Slip 1 1/2 inches of the shorter webbing length through metal buckle (3).

(d) Secure buckle (3) in webbing with a 1-inch long, single-X box stitch formation.

(e) Position leg straps (1) in original locations on carrying case (2) and secure with a 2-inch long, single-X box stitch formation with a double row of stitches at each end.

(f) Position buckle strap in original location and secure with a 2-inch long, single-X box stitching formation with a double row of stitches at each end.

b. Replace.

(1) Remove governor, rope, log card and maintenance manual from carrying case.

(2) Procure a new carrying case from stock.

(3) Insert maintenance manual and log record card into front pouch.

(4) Stow governor and rope in carrying case.

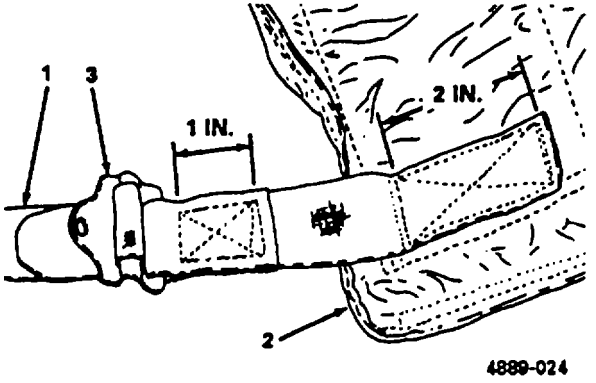


Figure 3-3. Replace Leg Strap.

3-13. Governor Assembly.

This task covers: a. Inspect c. Repair
b. Test d. Replace

Tools: .
Knife, Item 2, Appendix B
Shears, Item 6, Appendix B
Gage, Governor, Item 1, Appendix C

Materials/Parts:

Cord, Nylon, Type II, Item 2, Appendix D

Materials/Parts (cont):
Wire, Steel, 0.080-Inch Dia, Item 13, Appendix D
Cloth, Crocus

a. *Inspect*. (figure 3-4). Inspect the governor with the governor wear gage.

b. *Test*

(1) Clean each rung with a crocus cloth.

NOTE

It may be necessary to reverse the direction of the gage; to allow two of the points to rest on undamaged area of rung.

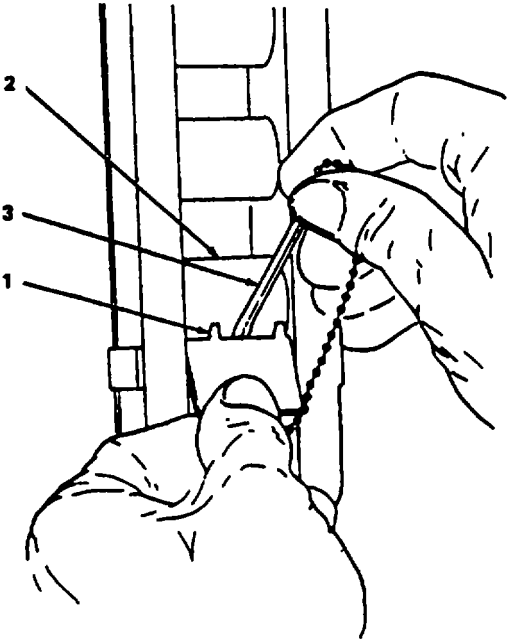


Figure 3-4. Inspect Governor Rungs

3-13. Governor Assembly (cont).

(2) Place the governor wear gage (1) against the rung (2).

NOTE

Keep ball feeler perpendicular to governor wear gage.

(3) Insert ball feeler (3) between rung (2) and cutout of wear gage (1).

(4) If ball feeler (3) drops through cutout of wear gage (1), replace governor.

c. *Repair*.

(1) *Restitching*. Restitching of governor web strap is not authorized. Governor web strap requiring repair must be replaced.

(2) *Replacing safety pin and lanyard*. (figure 3-5). Replace missing or damaged safety pin and/or lanyard as follows:

(a) Remove original lanyard (1) from governor snaphook (2). Discard lanyard (1) and safety pin (3).

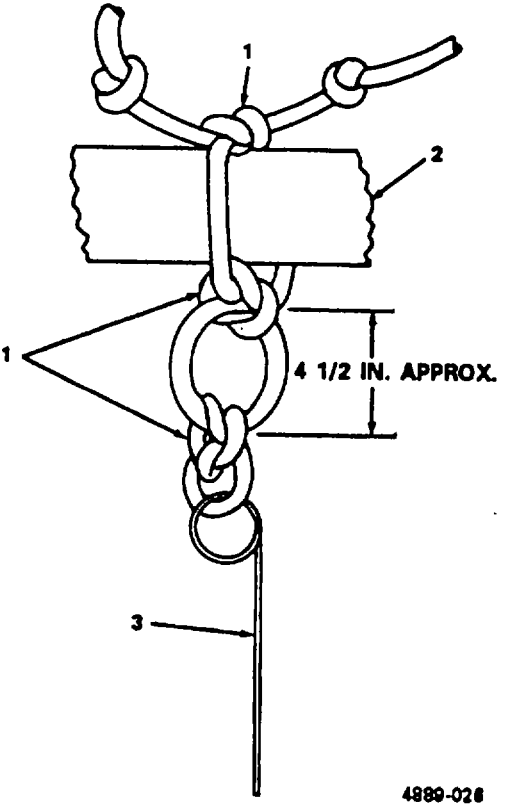


Figure 3-5. Lanyard Construction Details.

3-13. Governor Assembly (cont).

(b) Cut a 15-inch length of type II, nylon cord, remove core cords, and sear ends.

(c) Cut a 5-inch length of 0.0B0-inch diameter steel wire. Form safety pin (3).

(d) Pull cord halfway through loop in safety pin (3).

(e) Tie cord to safety pin (3) with a square knot.

(f) At a point 4 1/2 inch from first square knot, tie a second square knot.

(g) Tie cord around snaphook loop with square knot and tie overhand knots In each running end.

d. Replace. Replace an unserviceable/unrepairable governor assembly with one from stock.

3-14. Personnel Harness.

This task covers:
a. Inspect
b. Repair
c. Replace

Tools:
Shears, Item 6, Appendix B
Sewing Machine, Heavy Duty, Item 7, Appendix B
Sewing Machine, Medium Duty, Item 9, Appendix B

Materials/Parts:

Thread,,Nylon, Size 6, Item 10/11, Appendix D
Thread, Nylon, Size E, Item 8/9, Appendix D

Materials/Parts (cont):
Webbing, Elastic, Cotton, 1-Inch W, Item 12, Appendix D

Equipment Condition:

Laid out on table.

a. Inspect. Inspect personnel harness for rubs, cuts, tears, broken or missing stitching, missing or loose hardware and burrs.

b. *Repair*.

(1) *Restitching*. Restitch personnel harness using a heavy duty sewing machine and size 6 nylon thread. Stitch over original pattern, sewing five to eight stitches per inch. Lock each row of stitching 1/2 inch beyond at ends.

3-14. Personnel Harness (cont).

(2) *Replacing elastic keeper*. (figure 3-6)

(a) Remove original keeper (1) by cutting.

(b) Cut a 4 3/4-inch length of 1-inch cotton elastic webbing and sear ends.

(c) Fold webbing in half and align ends. Sew a row of stitching 1/2 inch from aligned ends.

(d) Fold both open ends of webbing against the keeper.

(e) Using medium duty sewing machine and size E nylon thread, sew both ends down 1/8 inch from edges through one thickness of the keeper.

(f) Slip elastic keeper (1) over free end of the waist strap.

c. *Replace*. Replace unserviceable or unrepairable personnel harness with one from stock.

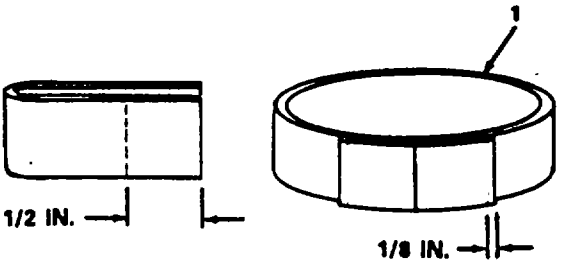


Figure 3-6. Replace Elastic Band.

3-15. Rope.

This task covers: a. Inspect
b. Replace

Tools:

Knife, Item 2, Appendix B

Materials/Parts:

Tape, Pressure Sensitive, Item 14, Appendix D

Materials/Parts (cont):.

Rope, Nylon, 3/8-Inch Diameter, Item 6, Appendix D

WARNING

The rope shall not be used after 10 lowering operations when visibly frayed or deteriorated, or after contact with any contaminant which could reduce its strength.

a. *Inspect*. Check to see that the rope is not frayed, abraded, melted, cut, or otherwise damaged. Melting damage can be detected by a rough feel of the rope surface. Discard the rope for personnel use when it shows signs of fraying or melting damage. Discard the rope for cargo use when SEVERE fraying or melting damage is noted. Insure the rope is dry and is 150-feet long.

NOTE

Lowerings made with maximum possible rates of descent may result in some melting damage to the outer fibers of the rope.

WARNING

When in doubt about the serviceablity of lowering rope, replace it.

b. Replace.

(1) Cut a 150-foot length of rope from bulk spool.

(2) Using pressure sensitive tape at a point 1/2 Inch from ends of rope, wind the tape two complete turns around rope.

(3) Trim ends of rope and sear.

3-16. Rope Snaphook.

This task covers: a. Inspect
b. Repair
c. Replace

Tools:	*Materials/Parts (cont):*
Knife, Item 2, Appendix B	Wire, Steel, 0.080-Inch Dia, Item 13, Appendix D
Shears, Item 6, Appendix B	
Materials/Parts:	*Equipment Condition:*
Cord, Nylon, Type II, Item 2, Appendix D	Unpacked. Lowering device with defects recorded and clean.

a. *Inspect*. Inspect the snaphook for cracks, and insure spring-loaded closure is not deformed or otherwise damaged. Insure that safety pin and lanyard are not missing a and are in serviceable condition.

b. *Repair*.

(1) *Replacing safety pin and lanyard*. (figure 3-7). Replace missing or damaged safety pin and/or lanyard as follows:

(a) Remove original lanyard (1) from rope snaphook. Discard lanyard (1) and safety pin (2).

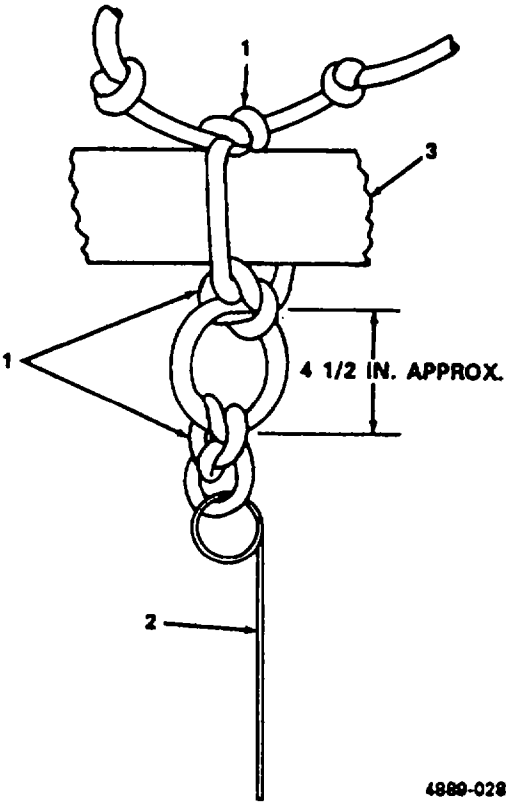


Figure 3-7. Lanyard and Safety Pin Construction Details.

3-16. Rope Snaphook (cont).

(b) Cut a 15-inch length of type II, nylon cord. Remove core cords and sear ends.

(c) Cut a 5-inch length of 0.080-inch diameter steel wire. Form safety pin (2).

(d) Pull cord halfway through loop in safety pin (2).

(e Tie cord to safety pin (2) with a square knot.

(f) At a point 4 1/2 inch from first square knot, tie a second square knot.

(g) Tie cord around snaphook (3), loop with square knot and tie overhand knots in each running end.

c. *Replace*. Replace an unserviceable/unrepairable governor assembly with one from stock.

3-17. Tiedown Assembly, Aircraft Floor Anchoring Device.

This task covers: a. Inspect
b. Repair
c. Replace

Tools:
Brush, Stencil, Item 1, Appendix B
Sewing Machine, Medium Duty, Item 9, Appendix B

Materials/Parts:
Nylon Thread, Size E, Item 9, Appendix D

Materials/Parts (cont):
Ink, Strata-Blue, Item 3, Appendix D
Stencil Board, Item 7, Appendix D

Equipment Condition:
Laid out on work table.

a. *Inspect*. Inspect tiedown assembly for rubs, cuts, tears, broken or missing stitching, missing or loose hardware and burrs.

b. *Repair*.

(1) *Restencil*. Restencil tiedown assembly when lettering becomes illegible. Use strata-blue marking ink and standard stenciling brush and oiled stencil board, and restencil over original lettering, as per paragraph 3-11.

3-17. Tiedown Assembly, Aircraft Floor Anchoring Device (cont).

(2) *Restitch*. Restitch broken or missing stitching with size E thread and a medium duty sewing machine according to paragraph 3-9.

c. Replace. Replace an unserviceable/unrepairable tiedown harness with one from stock.

Section V. PREPARATION FOR STORAGE OR SHIPMENT

3-18. Storage

a. Storage Criteria. Administrative storage of air delivery equipment will be accomplished in accordance with AR 750-1 and the instructions furnished below.

b. *General Storage Requirements*. To insure that serviceability standards of stored air delivery equipment are maintained, every effort will be exerted to adhere to the following storage requirements:

(1) When available, a heated building should be used to store airdrop items.
(2) Air delivery equipment will be stored in a dry, well-ventilated location and protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.
(3) delivery equipment will not be stored in a manner which would prevent ventilation or interfere with light fixtures, heating vents, fire-fighting devices, cooling units, exits, or fire door.
(4) Airdrop items will not be stored in a damaged, dirty, or damp condition.
(5) All stored airdrop items will be marked, segregated, and located for accessibility and easy identification.
(6) Air delivery equipment will not be stored in direct contact with any building floor or wall. Storage will be accomplished using bins, shelves, pallets, racks, or dunnage to provide airspace between the storage area floor and the equipment. If preconstructed shelving or similar storage accommodations are not available, locally fabricate storage provisions using suitable lumber of wooden boxes.

(7) All available materials handling equipment should be used as much as possible in the handling of air-drop items.
(8) Periodic rotation of stock, conversion of available space, proper housekeeping policies, and strict adherence to all safety regulations will be practiced at all times.

3-19. In-Storage Inspection.

a. *General Information*. An in-storage inspection is a physical check conducted on a random sample of air delivery equipment which are located in storage.

b. *Intervals*. Lowering devices in storage will be inspected at least semiannually and at more frequent intervals if prescribed by the local maintenance officer.

c. *Inspection*. Inspect to insure that the lowering device is ready for issue.

(1) Check the lowering device for proper identification.

(2) Check that no damage or deterioration has been incurred.

(3) Ensure that all modifications or similar requirements have been completed.

(4) Check the adequacy of the storage facilities; efforts taken to control pests and rodents; and protection against unfavorable climatic conditions.

3-20. Shipment.

a. *Initial Shipment*. The initial packaging and shipping of air delivery equipment is the responsibility of item manufacturers who are required to comply with federal and military packing specifications as stipulated in contractual agreements. Air delivery equipment is normally shipped to depot activities by domestic freight or parcel post, packaged to comply with overseas shipping requirements. Except for those airdrop items which are unpackaged and subjected to random inspections or testing by a depot activity, air delivery equipment received by a using unit will be contained in original packaging materials.

b. *Shipping Between Maintenance Activities*. The shipping of air delivery equipment between organizational and direct support maintenance activities will be accomplished on a signature verification basis using whatever means of transportation are available. During shipment, every effort will be made to protect airdrop items from weather elements, dust, dirt, oil, grease, and acids. Vehicles used to transport air delivery equipment will be inspected to ensure the items are protected from the previously cited material damaging conditions.

c. *Other Shipping Instructions*. Air delivery equipment destined for domestic or overseas shipment will be packaged and marked in accordance with AR 700-15, TM 38-230-1, and TM 38-230-2.

APPENDIX A

REFERENCES

A-1. Scope. This appendix lists all forms, technical manuals, and miscellaneous publications referenced in this manual.

A-2. Publication Indexes. The following publication indexes should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to the material covered in this manual:

Consolidated Index of Army Publications and Blank Forms	DA PAM 310-1
The Army Maintenance Management System (TAMMS)	DA PAM 738-750
The Army Maintenance Management System - Aviation (TAMMSA)	DA PAM 738-751

A-3. Technical Manuals.

Preservation, Packaging, Packing of Military Supplies and Equipment (Vols 1 and 2).....	TM 38-230-1 and TM 38-230-2
Procedures for the Destruction of Air Delivery Equipment to Prevent Enemy Use	TM 43-0002-1

A-4. Field Manuals.

First Aid for Soldiers	FM 21-11

A-5. Army Regulations.

Dictionary of United States Army Terms	AR 310-25
Authorized Abbreviation and Brevity Codes.....	AR 310-50
Packaging of Material.....	AR 700-15
Army Materiel Maintenance Concepts and Policies.....	AR 750-1
Accident Reporting and Records.....	AR 385-40

Accounting for Lost, Damaged and Destroyed Property.....	AR 735-11
Supply Procedures for TOE and TDA Units or Activities	AR 735-35
Defense Disposal Manual.....	DOD 4160-21-M

A-6. Technical Bulletins.

Maintenance Expenditure Limits for FSC Group 16	TB 43-0002-43

A-7. Forms.

Packing Improvement Report.....	SF Form 364
Quality Deficiency Report.....	SF Form 368
Equipment, Inspection and Maintenance Worksheet.....	DA form 2404
Recommend Changes to Publications and Blank Forms.....	DA Form 2028

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions will be limited to and defined as follows:

a. *Inspect*. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. .*Test*. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. *Service*. Operations required periodically to keep an item in proper operating condition; i.e., clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids or gases.

d. *Adjust*. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Aline*. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate*. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Remove/install*. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. *Replace*. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace' is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. *Repair*. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify trouble and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. *Overhaul*. That maintenance effort (service/ action) prescribed to restore an item to a completely serviceable/ operational condition as required by maintenance standards in appropriate technical publications (i. e. , DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. *Rebuild*. Consists of those services/actions necessary for the restoration of unserviceable equipment to like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel

maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II

a. *Column 1, Group Number*. Column 1 lists functional group code numbers the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group shall be "00'.

b. *Column 2, Component/Assembly*. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance/Function*. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2).

d. *Column 4, Maintenance Level*. Column 4 specifies, by the listing of work time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform the function listed in indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be

shown, for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module and item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C - Operator or crew
O - Unit Maintenance
F - Intermediate Direct Support Maintenance
H - Intermediate General Support Maintenance
L - Specialized Repair Activity (SRA)
D - Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tools sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. Explanation of Columns In Tool and Test Equipment Requirements, Section III.

a. *Column 1, Reference Code*. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. *Column 2, Maintenance Category*. The lowest category of maintenance authorized to use the tool or test equipment.

c. *Column 3, Nomenclature*. Name or identification of the tool or test equipment.

d. *Column 4, National Stock Number*. The National stock number of the tool or test equipment.

e. *Column 5, Tool Number*. The manufacturer's part number.

B-5. Explanation of Columns In Remarks, Section IV

a. *Column 1, Reference Code*. The code recorded in column 6, Section II.

b. *Column 2, Remarks*. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR LOWERING DEVICE

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Intermediate		Depot	Tools	
Group No.	Component/ assembly	Maintenance function	C	O	F	H	D	and equipment	Remarks
00	Lowering Device	Inspect		0.6					B
		Replace		0.1					
	Carrying Case	Inspect		0.1					
		Repair		0.2					C
		Replace		0.1					
	Governor Assy	Inspect		0.1				1	A
		Test		0.1					
		Repair		0.1					
		Replace		0.1					
	Personnel Harness	Inspect		0.1					
		Repair		0.2					
		Replace		0.1					

MAINTENANCE ALLOCATION CHART FOR LOWERING DEVICE(cont)

(1) Group No.	(2) Component/ assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
	Rope	Inspect		0.2					
		Replace		0.2					
	Rope	Inspect		0.1					
	Snaphook	Repair		0.1					
		Replace		0.1					
04	Tiedown Assy Aircraft Floor Anchor-ing Device	Inspect		0.2					
		Repair		0.2					
		Replace		0.1					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or test equipment ref code (1)	Maintenance category (2)	Nomenclature (3)	National NATO stock number (4)	PN Tool number (5)
1	O	Brush, Stenciling	7520-0248-9285	H-B-621
2	O	Knife	5110-00-162-2205	MIL-K-818C
3	O	Knife, Hot Metal	3439-01-197-7656	4025
4	O	Needle, Tacking	8315-0262-3733	FF-N-180
5	O	Pot, Melting, Electric	5120-00-242-1276	WG441
6	O	Shears	51 1 0-0223-6370	GGG-S-278
7	O	Sewing Machine Heavy-Duty	See Table 3-2	
8	O	Sewing Machine, Darning	See Table 3-2	
9	O	Sewing Machine, Medium	See Table 3-2	
10	O	Screwdriver, Rat Tip	5120-0293-0314	GGG-S-121
11	O	Yardstick	5120-00-985-6610	GGG-Y0035

Section IV. REMARKS

Reference Code	Remarks/Notes
A	Inspect is o use wear gage.
B	Inspect is a technical-type inspection
C	Repair at unit maintenance consists of darning, restitching, patch ing and replacement of parts authorized for unit maintenance.

APPENDIX C
REPAIR PARTS AND SPECIAL TOOLS LIST
Section I. INTRODUCTION

C-1. **Scope.** This manual lists and authorizes spare and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the personnel/ cargo lowering device. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

C-2. **General.** This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in name sequence. Items listed are shown on the associated illustration/figure

b. Section III. Special Tools List. Common tools are listed in Appendix B., Section II because they are required for performance of packing and maintenance procedures/tasks. These tools are authorized under Chapter 3, paragraph 3-2
of this manual.

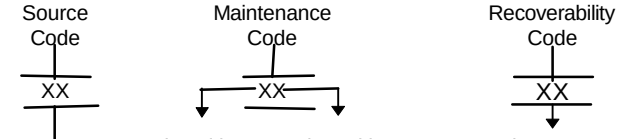
c. Section IV. National Stock Number and Part Number

Index. A list, in National item identification number (NIIN) sequence, of all National Stock Numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross- referenced to each illustration figure and item number appearance.

C-3. Explanation of Columns (Sections II).

a Item No. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code contain- ing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:



1st two positions	3rd position	4th position	Who determines disposition action on an unserviceable item
How you get an item	Who can install, replace or use the item	Who can do complete repair* on the item	

*Complete Repair: Maintenance capacity, capability, and authority to perform all the corrective maintenance tasks of the "Repairs function in a use/user environment in order to restore serviceability to a failed item.

(1) Source code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Source codes are always the first two positions of the SMR code. Explanations of source codes follow:

Code	Explanation
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code.
	Explanation
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.

Code	Explanation
MO - (Made at org/ AVUM Level) AVUM Level) MH - (Made at GS Level) ML - (Made at Specialized Repair Activity (SRA) MD - (Made at Depot)	Items with these codes are not to be requested/ requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Code	Explanation
AO - (Assembled by org/AVUM Level) AF - (Assembled by DS/AVIM Level) AH- (Assembled by GS Category) AL- (Assembled by SRA) AD - (Assembled by Depot)	items with these codes are not to be requested/ requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

Code	Explanation
XA -	Do not requisition an "XA' - coded item. Order its next higher assembly. (Also refer to the NOTE below.)
XB	H an "XB' item is not available from salvage, order it using the FSCM and part number given.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD-	is not stocked. Order an "XD'- coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

(2) Maintenance code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance.

Code	Application/Explanation
C -	Crew or operator maintenance done within organizational or aviation unit maintenance.
O -	Organizational or aviation unit category can remove, replace, and use the item.
F -	Direct support or aviation intermediate level can remove, replace, and use the item.
H	General support level can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
D-	Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions.) (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR code.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O-	Organizational or aviation unit is the lowest level that can do complete repair of the item.
F-	Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
H-	General support is the lowest level that can do complete repair of the item.
L-	Specialized repair activity (designate the specialized repair activity) is the lowest level that can do complete repair of the item.
D-	Depot is the lowest level that can do complete repair of the item.
Z-	Nonreparable. No repair is authorized.

Code	Application/Explanation
B-	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B' coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) *Recoverability code.* Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability codes	Application/Explanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.
O -	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit level.
F-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.

Recoverability codes	Application/Explanation
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D-	Reparable item. When beyond lower level repair capability, return to depot.. Condemnation and disposal of item not authorized below depot level.
L-	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A-	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/ directives for specific instructions.

c. FSCM (Column(3)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. Part Number (Column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its

engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. Description and Usable on Code (UOC) {Column (5)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The physical security classification of the item is indicated by the parenthetical entry; insert applicable physical security classification abbreviation (e.g., Phy Sec C1 (C) - Confidential, Phy Sec Cl (S) - Secret, Phy Sec Cl (T) - Top Secret).

(3) Items that are included in kits and sets are listed below the name of the kit or set.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).

(7) The usable on code, when applicable (see paragraph 5, Special Information).

(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement "End of Figure" appears just below the last item description in Column 5 for a given figure in Section II.

f. *Qty (Column (6)).* The Qty (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in the column in lieu of a quantity indicates that the quantity is variable and may vary from application to application.

C-4. **Special Information.**

a. The "Usable on Code" title appears in the lower right corner of column (5) Description. Usable on codes are shown in the right-hand margin of the description column.

b. Bulk materials required to manufacture items are listed in the Bulk Material Group of this manual. NSN's for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/ fabricated. Detailed manufacturing instructions for items source coded to be manufactured or fabricated are found in this manual.

c. Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in this manual. Items that make up the assembly are listed immediately following the assembled item entry.

d. Line item entries for repair parts kits and sets appear as the last entries in the repair parts listing for the figure in which their parts are listed as repair parts.

e. Items which have the word Bulk in the figure number column will have an index number shown in the item number column. This index number is furnished for use as a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

f. In the repair parts list, some items are indented to show that they are a component or components of the item under which they are indented.

C-5. Explanation of Columns (Section IV).

a. National Stock Number (NSN) Index.

(1) Stock number column. This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e., NSN 5305-01-064-1467). NIIN When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) Fig. column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II.

(3) Item column. The item number identifies the item associated with the figure listed in the adjacent Fig. column. This item is also identified by the NSN listed on the same line.

b. Part Number Index. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group In order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

(1) FSCM column. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(2) Part number column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

(3) Stock number column. This column lists the NSN for the associated part number and manufacturer identified in the part number and FSCM columns to the left.

(4) Fig. column. This column lists the number of the figure where the item is identified/located in Section II and III.

(5) (5) Item column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

C-6. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Not Known.

(1) First. Using the table of contents, determine the functional group or subfunctional group to which the item belongs. This is necessary since figures are prepared for functional groups and subfunctional groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the functional group or subfunctional group to which the item belongs.
(3) Third. Identify the items on the figure and note the item number.

(4) *Fourth.* Refer to the Repair Parts List for the figure to find the line entry for the item number noted on the figure.

(5) Fifth. Refer to the Part Number Index to find the NSN, if assigned.

b. When National Stock Number or Part Number is Known.

(1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see 4.a.(1)). The part numbers

in the Part Number index are listed in ascending alphanumeric sequence (see 4.b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

*The NIIN consists of the last 9 digits of the NSN (i.e., 5305-01-064-1467).

NSN
NIIN

(2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

C-7. **Abbreviations.**

Abbreviations	Explanation
EA	Each
FT	Foot/Feet
IN.	Inch/Inches
LG	Long
MTG	Mounting
NF	National Fine (Thread)
OZ	Ounce(s)
TU	Tube
U/O	Used On

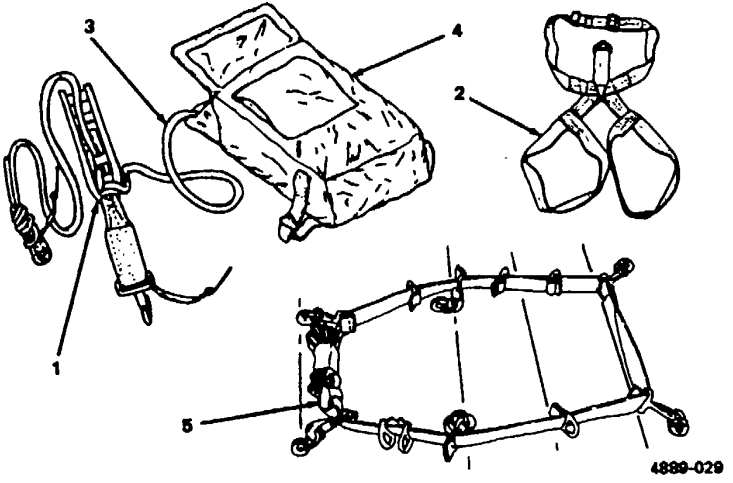
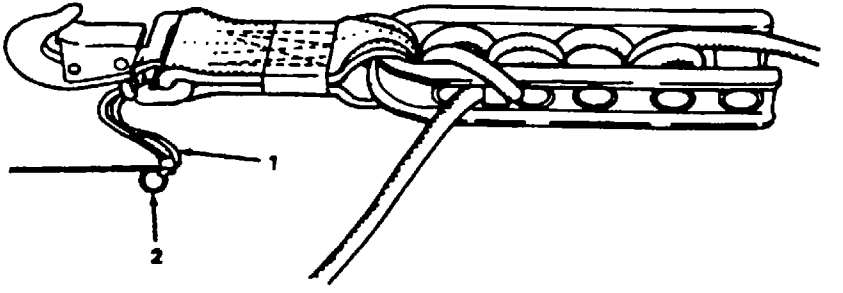


Figure C-1. Personnel/Cargo Lowering Device Components

SECTION II. REPAIR PARTS UST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 00 LOWERING DEVICE, PERSONNEL AND CARGO FIG. C-1 PERSONNEL AND CARGO LOWERING DEVICE 11-1-701	
1	PAOZZ	81337	11-1-703	GOVERNOR ASSEMBLY.....	1
2	PAOZZ	81337	11-1-702	HARNESS, PERSONNEL.....	1
3	MOOZZ	81337	11-1-701-1	ROPE.....	1
4	PAOOZ	81337	11-1-704	CASE, CARRYING	1
5	PAOOZ	81337	11-1-884	DEVICE, ANCHORING.....	1
				END OF FIGURE	



4989-030

Figure C-2. Governor Assembly Components

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
1	MOOZZ	81337	11-1-703-6	GROUP 01 GOVERNOR ASSEMBLY	
2	MOOZZ	81337	11-1-703-7	FIG. C-2 GOVERNOR ASSEMBLY	
				11-1-703	
				LANYARD, MAKE FROM, CORD,	1
				NYLON, TYPE III, OD, MILC 5040	
				PIN, SAFETY, MAKE FROM WIRE,	
				0.80 IN. DIAMETER, QQW-423	1
				END OF FIGURE	

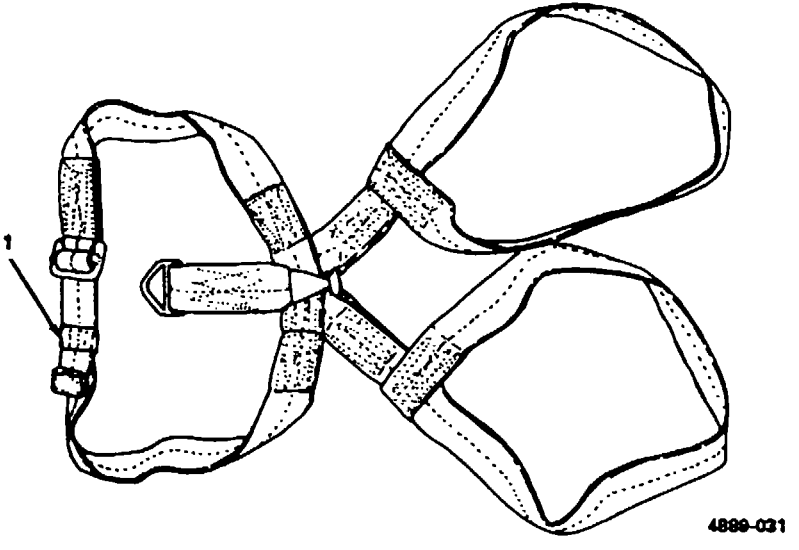
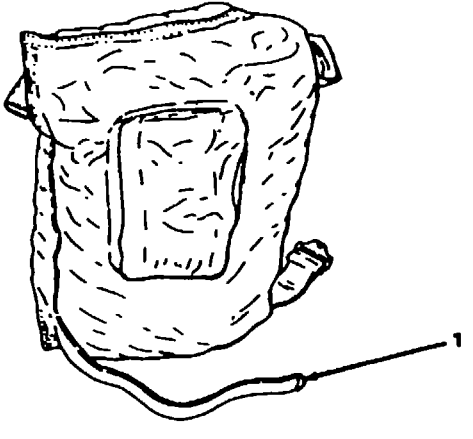


Figure C-3. Personnel Harness Components

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 02 HARNESS PERSONNEL FIG. C-3 PERSONNEL, HARNESS 11-1-702	
1	MOOZZ	81337	11-1-702-5	KEEPER STRAP, ,MAKE FROM, WEBBING, COTTON ELASTIC. 1 -IN. WIDE, CLASS 1,MIL;-W-5664 END OF FIGURE	1



4889-032

Figure C-4. Carrying Case.

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
1	MOOOO	81337	11-1-704-4	GROUP 03 CASE, CARRYING FIG. C-4 CARRYING CASE 11-1-704 STRAP LEG, MAKE FROM, WEBBING, 1-IN. WIDE, CLASS 1, MIL-T-5038 END OF FIGURE	1

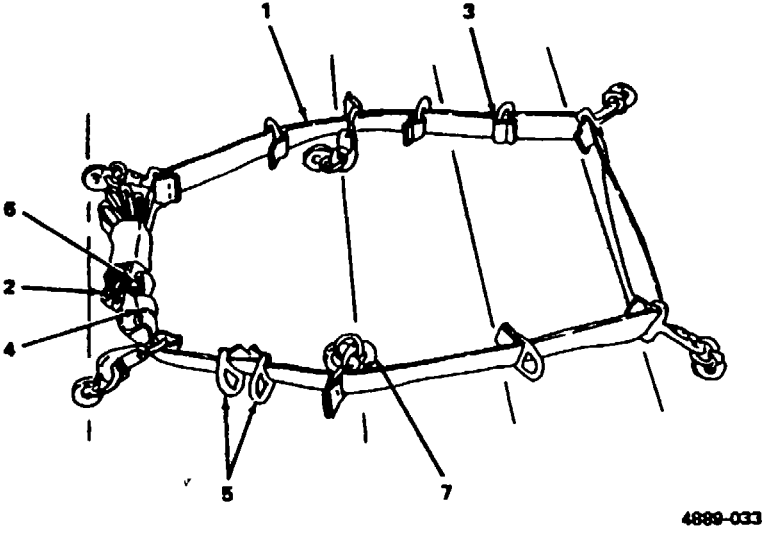


Figure C-5. Tiedown Assembly Aircraft Floor, Anchoring Device

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 04 DEVICE, ANCHORING FIG. C-5 ANCHORING DEVICE 11-1-884	
1	XAOZZ	81337	11-1-884-2	LOOP	1
2	XAOZZ	81337	11-1884-3	BUFFER, LONG	1
3	XAOZZ	81337	11-1884-4	BUFFER, SHORT	1
4	XAOZZ	81337	11-1884-5	KEEPER	1
5	XAOZZ	81337	11-1-884-8	D-RING	1
6	XAOZZ	81337	11-1884-9	ADAPTER, QUICK FIT	1
7	XAOZZ		11-1-884-10	SNAP, CONNECTOR	1
				END OF FIGURE	

SECTION II

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 99 BULKS MATERIALS FIG. BULK	
1	MOOZZ	81337	11-1-703-6		
2	MOOZZ	81337	11-1-701-1	CORD, NYLON TYPE III	
3	MOOZA	81337	11-1-702-5	ROPE, NYLON, 3/8 IN. DIA	
4	MOOZZ	81337	11-1-705-4	WEBBING, COTTON, ELASTIC WIRE, NONELECTRICAL, 0.80 IN. DIA END OF FIGURE	

SECTION III

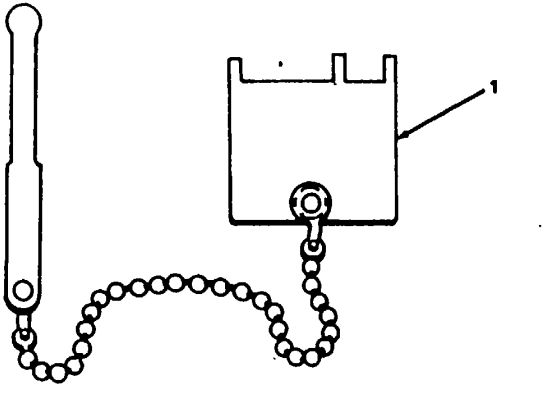


Figure C-6. Governor Wear Gage.

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
1	PAOZZ	81337	11-1-706	GROUP 05 SPECIAL TOOLS FIG. C-6 SPECIAL TOOLS, GOVERNOR WEAR GAGE GAGE, GOVERNOR WEAR ..... END OF FIGURE	1

SECTION IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX
NATIONAL STOCK NUMBER INDEX

Stock Number	Fig.	Item
1670-00-927-1244	C-1	1
1670-00-927-1245	C-1	2
1670-00-927-7348	C-1	4
1670-00-999-0758	C-1	-
5220-00-916-5850	C-6	1

Section IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX
PART NUMBER INDEX

FSCM	Part Number	Stock Number	Fig.	Item
81337	11-1-701	1670-00-999-0758	C-1	-
81337	11-1-702	1670-00-927-1245	C-1	2
81337	11-1-702-5		C-3	1
81337	11-1-703	1670-00-927-1244	C-1	1
81337	11-1-703-6		C-2	1
81337	11-1-704	1670-00-927-7348	C-1	4
81337	11-1-884	1670-00-999-3544	C-1	5
81337	11-1-706	5220-00-916-5850	C-6	1

APPENDIX D

EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST
Section I. INTRODUCTION

D-1. **Scope. This** appendix lists expendable supplies and materials you need to operate and maintain the personnel/cargo lowering device. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. **Explanation of Columns.**

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use Cloth, Abrasive Item 5, App. D).

b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item. (Enter as applicable).

C - Operator/Crew

O - Organizational Maintenance - Unit Maintenance

F - Direct Support Maintenance - Intermediate Maintenance

H - General Support Maintenance - Intermediate Maintenance

D - Depot Maintenance

c. Column (3) - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) - Description. Indicates the Federal item name and, if required, a description to identify the item.

e. Column (5) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIAL LIST

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) U/M
1	O	8300205-1478	Webbing, Nylon, Type IV	ft
2	O	40200-965-0473	Cord, Nylon, Type 11, OD (81349) MIL-7515	yd
3	O	7510-286-5362	Ink, Marking, Strat Blue (81349) MIL-I-6903	pt
4	O	7520-00-230-2734	Marker, Felt Tip, Black (81348) GG-M-0014	ea
5	O	75200491-2917	Pen, Ballpoint (81348) GG-B0060	ea
6	O	402000-946-0436	Rope, Nylon, 3/4 In. Dia	ft
7	O	9310-00-160-7858	Stencil Board, Oiled, Type 11 (81348) UUS-625	sh
8	0	83100-262-2770	Thread, Nylon, Size E, Natural White (81348) V-T-295 Type I, Class A	yd

EXPENDABLE/DURABLE SUPPLIES AND MATERIAL LIST (cont)

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) U/M
9	O	831-00-262-2772	Thread, Nylon, Size E, OD (81348) V-T-295 Type I, Class A	yd
10	O	83100- 248-9714	Thread, Nylon, Size 6, Natural White (81348) V-T-295 Type I, Class A	yd
11	O	8310-00267-3027 V-T-295 Type I, Class A	Thread, Nylon, Size 6, OD (81348)	yd
12	O	830500-7536086	Webbing, Elastic, Cotton, Type X, OD (81349) MIL-W-5665	yd
13	O		Wire, Steel, 0.080-In. Dia	
14	O	7510-00-633-0199	Tape, Pressure Sensitive, 1-In. (81348) PPP-T-60	rl

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INDEX (cont)

By **Order of the Secretary of the Army**

CARL E. VUONO
General. United States Army
Chief of Staff

Official:

PATRICIA P. HICKERSON
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THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3.2808.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu in.
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Square measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.
1 sq. decimeter = 100 sq. centimeters = 15.5 inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 feet
1 sq. dekameter (are) = 100 sq. meters = 1.076.4 sq. ft.
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 hectometers = .386 sq. miles

Liquid Measure

1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kilohter = 10 hectoliters = 264.18 gallons
1 liter = 10 deciliters = 33.81 fl. ounces
1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3 38 fl. ounces
1 metric ton = 10 quintals = 1.1 short tons

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce inches	newton-meters	.0070062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
sq. inches	sq. centimeters	6.451	kilometers	miles	.621
sq. feet	sq. meters	.093	sq. centimeters	sq. inches	.155
sq. yards	sq. meters	.836	sq. meters	sq. yards	10.764
sq. miles	sq. kilometers	2.590	sq. kilometers	sq. miles	1.196
acres	sq. hectometers	.405	sq. hectometers	acres	2.471
cubic feet	cubic meters	.028	cubic meters	cubic feet	35.315
cubic yards	cubic meters	.765	milliliters	fluid ounces	.034
fluid ounces	milliliters	29.573	liters	pints	2.113
pints	liters	.472	liters	quarts	1.057
quarts	liters	.946	grams	ounces	.035
gallons	liters	3.785	kilograms	pounds	2.205
ounces	grams	28.349	metric tons	short tons	1.102
pounds	kilograms	.454	pound-feet	newton-meters	1.356
short tons	metric tons	.907			
pound inches	newton-meters	.11296			

Temperature (Exact)

°F Fahrenheit temperature — 5/9 (after subtracting 32) — Celsius Temperature °C

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