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Title - Sujet SLEEPING BAG SYSTEMS	
Solicitation No. - N° de l'invitation W8486-151419/D	**Amendment No. - N° modif.** 007
Client Reference No. - N° de référence du client W8486-151419	**Date** 2017-04-24
GETS Reference No. - N° de référence de SEAG PW-$$PR-760-72166	
File No. - N° de dossier pr760.W8486-151419	**CCC No./N° CCC - FMS No./N° VME**
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AMENDMENT 007

This amendment is raised to add a paragraph to Annex D as follows:

In Annex D, after paragraph 5.4.3.4.2, please insert the following:

5.4.3.5 During the User Acceptance Performance Evaluation (UAPE), the bidder's Sleeping Bag Systems must continue to meet all of the Mandatory requirements of all phases, as referenced in this Annex.

This amendment also answers questions from potential bidders.

QUESTION 11:
Can the Draft Manual be digital for B1?

ANSWER:
No. For data integrity, record keeping purposes and to eliminate the possibility of file conversion or file transfer errors, all document-style bid deliverables must be submitted in hard copy only.

QUESTION 12:
Does the draft manual have to include, Bivy bag, Mattress, compression sack? Ruck sac? And if so to what extent? If so does the DND want mattress outside or inside Bivy Bag?

ANSWER:
Recommended instructions for using the sleeping bag system with current Canadian Armed Forces equipment are not required in the draft Product Manual until Phase B2 and B3, per s. 6.1.4.16 and 6.1.5.1 of Annex D.

In Phase B2 onward, the draft Product Manual must include recommended instructions for using the sleeping bag system with current Canadian Armed Forces equipment (per s. 3.5.3.1.6 of Annex B). In Phase B3, the draft Product Manual must also include the recommended size of bivy bag to use with each standard size of sleeping bag system (per s. 3.5.3.1.7 of Annex B), and any recommended packing configurations and instructions (per 3.5.3.1.8 of Annex B). The extent of the instructions is up to Bidders, but they must be included so that they can be referred to during tests and evaluations.

Regarding mattress placement, it is up to Bidders to recommend how their sleeping bag system should be used with the bivy bag and mattress in different situations, however the current bivy bag was not designed to be used with a mattress inside of it. Note that all thermal insulation testing must be done with the mattress outside of the bivy bag in accordance with s. 3.2.1.1.7 of Annex B.

QUESTION 13:
For protective storage bag, would the DND like each bag/Liner to have its own protective bag? Or to have all parts in one protective bag? Or both?

ANSWER:
The storage bag is intended to hold one complete sleeping bag system, per s. 3.1.10.1 of Annex B: "The Sleeping Bag System must include a Storage Bag".

Sleeping bag systems and their sleeping modules have different packing and packaging requirements depending on the circumstances:

- In Phase B2, sleeping bag system samples can be submitted in any suitably protective packaging, per s. 6.1.4.16 of Annex D (they are not required to be submitted in a Storage Bag like the one in s. 3.1.10 of Annex B). They must also be submitted in accordance with s. 6.2.7 of Annex D.

- In Phase B3, sleeping bag system samples must be submitted packed in accordance with s. 3.6.1 of Annex B, per s. 6.1.5.1 of Annex D (they must be submitted in a Storage Bag in accordance with s. 3.1.10.1 of Annex B, per s. 6.1.5.1 of Annex D). They must also be submitted in accordance with s. 6.2.7 of Annex D.

- Complete sleeping bag systems provided under contract must be packaged in accordance with s. 3.6 and 3.7 of Annex B.

- Sleeping modules provided under contract, but not provided as part of a complete sleeping bag system, must be packaged in accordance with s. 3.7.4 of Annex B.

QUESTION 14:
Also will the user be standard wearing boots when using the sleeping bag?

ANSWER:
The wearing of boots in the sleeping bag may occur during field operations and training. However, for the purposes of the User Acceptance Performance Evaluation at Phase B3, boots will not be worn.

QUESTION 15:
What is the solution for a pillow for the soldiers? Is there one? Will points be added for one? If one is included will it be used during the tests for comfort?

ANSWER:
Bidders can include a pillow solution if they wish. Points will not be attributed directly for such a solution. Any part of the pillow solution that is permanently attached to one of the sleeping modules will be considered part of that module for all intents and purposes. If the pillow solution is completely detachable from the rest of the sleeping bag system, it will be considered a distinct sleeping module for all intents and purposes. In either of these cases, the pillow solution forms part of the system and must be tested under the same criteria as the system in accordance with the Specification and as outlined in all Phases of the Evaluation.

QUESTION 16:
Also would the DND like an option for Mosquito mesh around the face opening? Or compatibility with the in-service insect head net?

ANSWER:
DND has not expressed any criteria or requirement for a mosquito mesh option, nor for compatibility with the in-service insect head-net. Points will not be attributed directly for such a solution. During the UAPE, users will not be provided with in-service insect head-nets, nor will they be queried on the sleeping bag system's compatibility with this item.

QUESTION 17:
Also can we get digital copies of the current user manuals, for the supplied samples, and sleeping bag?

ANSWER:
No manuals are available for the in-service sleeping bag system, mattress or bivy bag. Manuals for the waterproof compression sack, rucksack, and a very similar sleeping bag system to the in-service model are attached herein.

QUESTION 18:
We would like to know if DND will accept MONTHLY delivery terms containing higher quantities of SBS so that we may optimize on shipping by sending a full truck to the Montreal depot and then a full truck to the Edmonton Depot? Unless there is a higher urgency for the SBS in one depot over the other at that time…….”

ANSWER:
Yes, DND will accept monthly deliveries with higher quantities of Sleeping Bag Systems.

All other terms and conditions remain unchanged.

SECTION 2 — SLEEPING BAG

207. General

1. The possibility of freezing to death when sleeping outdoors in below zero temperatures is one that haunts a man who has never had any experience living outdoors in cold weather conditions. This is a needless worry as the cold will always awaken you first. It is a known fact that people can sleep outdoors in sub-zero temperatures with no additional equipment or clothing with no fear of freezing to death as long as they are not physically exhausted. The issue sleeping bag and air mattress allows you to sleep comfortably in any weather conditions ranging from the tropics to areas of extreme cold providing you use it properly.

2. Personnel who do not exercise proper care and maintenance of their sleeping bags and air mattresses will find that the insulation value of them will be lost in a short period of time. They will then become a liability to their tent group. In order that you can spend an extended period of time in the field in cold climate conditions you must know how to care for and maintain your sleeping bag and air mattress.

3. Air Mattress

a. Characteristics of the air mattress:

(1) the general shape conforming to the sleeping bag;
(2) the six panels or tubes;
(3) the inflating bellows, valves, and stoppers;
(4) the inflating instructions stamped on the bellows;
(5) the "D" rings on each side which enables several mattresses to be tied together or allows the sleeping bag to be tied to the mattress. The latter is only used when securing casualties for evacuation;
(6) that the air mattress should not be inflated orally otherwise the stopper will freeze to the inlet stem and ice will form inside the air mattress from condensation of the breath. This will cause the rubber to crack when removing the stopper or rolling up the air mattress.

b. Inflate the air mattress as follows:

(1) Insert the bellows valve into the air mattress inlet stem.
(2) Using both hands, open the top of the bellows and punch it together. Lift the open end upwards in a quick motion and close the top quickly trapping air inside the bellows.

(3) Roll the bellows towards the air mattress thus forcing air into the air mattress. Continue until the air mattress is inflated. Correct inflation can be determined by pressing on the centre of the air mattress with the flat of the hand so that it just touches the ground.

(4) To insert the stopper, grasp the flat portion of the air mattress inlet stem firmly between the forefinger and thumb, remove the bellows valve and insert the stopper using a twisting motion.

(5) The air mattress should be left inflated overnight to check for leakages.

c. The following additional points should be noted:

(1) When pine boughs, etc., are used as additional insulation, care must be exercised in keeping sharp ends downwards to prevent air mattress punctures.

(2) Minor punctures can be repaired with adhesive tape.

(3) If an inflating bellow or valve becomes unserviceable on one air mattress, inflation can be accomplished by using the bellows of another air mattress.

(4) If air mattresses are not issued, or if the air mattress becomes unserviceable, tree branches, boughs, packboards, cardboard, etc., can be used under the sleeping bag to provide insulation.

208. Sleeping Bag - 1951 Pattern

1. The 1951 pattern sleeping bag consists of four main parts:

a. the cover;
b. the outer bag;
c. the inner bag; and
d. the liner.

Note: There is also a waterproof carrying bag, if required.

2. The Cover. The cover of the sleeping bag is made of moisture-proof nylon. It has tie tapes along the sides which are used to fasten it to the rings on the air mattress, but this is done only when carrying a casualty; otherwise the bag is not tied to the air mattress. The two long tapes at the bottom of the bag are used to secure the sleeping bag when it is rolled up. The cover should not be removed from the bag as its main purpose is to keep the bag clean and protect it from moisture. There are two tapes at the top of the cover to secure it to the outer bag.

3. The Outer Bag. The outer bag is downfilled. At the bottom of the bag there are two sets of snap-fasteners which are used to adjust

the length of the bag to the sleeper's requirements. At the top of the bag there are a series of snap-fasteners. There are two loops at the top to which the ties of the cover are fastened. A drawstring with a toggle and quick-release fastener is used to close the bag snugly around the user's neck. The second drawstring in the outer bag is used to draw the bag closer around the body.

4. The Inner Bag. The inner bag is made in the same way as the outer. There are two ties at the bottom. A small slit in the body of the bag admits the body drawstring of the outer. There is a drawstring at the top. The flannel flap at the top of the bag is used as a hood when sleeping. Loops on the inside of the bag are used for attaching the liner.

5. The Liner. The flannelette liner attaches to the inner bag by means of tapes. It has three leather-reinforced slits through which the body drawstrings and the top drawstrings of the inner and outer bags are threaded. There is a flap at the top of the liner which is used in conjunction with the flap of the inner bag.

6. Assembling the Sleeping Bag

a. Lay the inner bag on a flat surface inside out with the loops on the sides.
b. Place the liner on top with the tapes out; flannelette flaps must match (long side to long side, short side to short side).
c. Tie the tapes of liner to the loops of the inner bag.
d. Reach inside the inner bag, grasp the foot of the liner and turn right side out.
e. Thread the drawstring and quick release of inner bag through the liner.
f. Thread the long tapes of the flannelette flap of the liner through the loops of the flannelette flap of the inner bag.
g. Turn the outer bag inside out and place it on top of the inner bag.
h. Thread the body draw string, toggle, and quick release through the slit of the inner bag and leather reinforcements of the inner.
j. Thread the top drawstring, toggle, and quick release through the slit in the leather reinforcement on the flannelette of the inner bag and through the slit of the leather reinforcement of the liner.
k. Tie the bottom tapes of the inner bag to the bottom loops of the outer bag.
m. Reach in the outer bag, grasp the foot of the inner bag and turn right side out.

n. Fasten the snap fasteners at the top of the inner and outer bags.
p. Adjust the length of the sleeping bag by clipping together the snap-fasteners at the bottom of the outer sleeping bag.
q. Slip on the nylon cover and tie the two top tapes of the cover to the top loops of the outer bag. The sleeping bag is now assembled.
r. The remaining tapes along each side of the nylon cover are only used to secure a casualty in a sleeping bag to the air mattress.

7. Using the Sleeping Bag

a. To prepare the bag for use proceed as follows:
   (1) Lay the bag on the air mattress with long portions of the flannelette flaps down.
   (2) Fluff up the down in the sleeping bag to get the maximum benefit from the insulation.
   (3) Get into the bag.
   (4) Wrap the flannelette flaps around the head like a hood and secure them with the long tapes.
   (5) Tighten the top drawstring of the inner and outer bags and adjust the body drawstring.
   (6) On getting up, squeeze the warm moist air out of the sleeping bag, fluff up and squeeze out the air again.
   (7) Stow the sleeping bag away or turn it inside out and air it.

b. To get out of the sleeping bag quickly stand up inside the sleeping bag and loosen the drawstrings. This allows the bag to fall to the ground.

c. Do not wear more clothing than needed to keep warm because perspiration must be kept to a minimum to keep the bag dry:
   (1) The parka can be placed between the sleeping bag and air mattress with the head above the top of the bag opening. This will provide additional insulation and the hood can be worn over the head for added comfort.
   (2) Never keep dirty, damp socks on when getting into the sleeping bag. Keep a clean pair in the bag and use them only for sleeping.

d. Extra clothing can be used for added insulation under the sleeping bag, especially under the shoulders and hips. The sleeping bag is compressed at these points and as a result loses some of its insulating qualities.

8. Care and Maintenance

a. Inspect the bag before use for rips and tears. Any defects in the covering of the bag should be repaired immediately or the insulating down will be lost.
b. Keep the bag clean. Always remember to use the liner and the outer cover.
c. Dry the sleeping bag at every opportunity. The flaps will become quite wet from breathing into them while the user is asleep, and must be dried frequently.
d. Before assembling the bag, test all the tapes. If they are not secure, re-sew them.
e. Never take damp clothes into the sleeping bag to dry out. The sleeping bag only absorbs the dampness and loses some of its insulating value.
f. Do NOT eat or drink in your sleeping bag. If you spill liquid or food on the bag, the insulation value is lost.
g. Do NOT smoke while in your sleeping bag. The bag is covered with nylon and is highly inflammable.
h. When the sleeping bag is not in use or being aired out, it should be stored in the waterproof valise or in the rucksack.

209. Sleeping Bag - 1965 Pattern

1. General. The 1965 pattern sleeping bag consists of five main parts:

a. the outer bag;
b. the inner bag;
c. the liner;
d. the hood; and
e. waterproof carrying bag.

2. The Outer Bag. The outer bag is filled with 40% down and 60% feathers. At the bottom of the bag on the outside there are two tapes that are used to shorten the bag by tying the tapes into the webbing loop at the bottom of the zipper, thus adjusting the length to the sleeper's requirements. At the top of the bag there are three snap-fasteners that snap into three corresponding ones on the inner bag. The zipper can be easily opened by grasping the bag on each side of the zipper, pulling outwards. On the inside of the bag there are two loops at the foot and four double tapes, two at the shoulder and two at the waist. These are used to fasten the inner and outer bags together. There are no drawstrings or toggles on this pattern of sleeping bag.

3. The Inner Bag. The inner bag is made in the same manner as the outer. There are size loops on the inside, two at the foot, two at

the waist, and two at the shoulder. There are ten snap-fasteners on each side of the zipper and one at the back of the neck which corresponds to similar fasteners on the liner. In addition there are two single tapes at the shoulder. They are all used to fasten the bag to the liner. On the outside of the inner bag there are three pairs of double tapes which are used to fasten the inner and outer bags together. The three snap-fasteners at the neck are also used for this purpose.

4. The Liner. The flannelette liner attaches to the inner bag by corresponding double and single tapes and snap-fasteners as described above.

5. The Hood. The hood is a separate item made of the same material as the outer and inner bags. The shoulder length skirt has two elastic loops on each side through which the arms are placed thus holding it firmly in place on the wearers head. There are two "Velcro" fasteners, one at the neck and one at the bottom of the skirt.

6. Assembly, Use, Care, and Maintenance. Except for minor changes, the instructions contained in paras 6, 7, and 8 above apply.

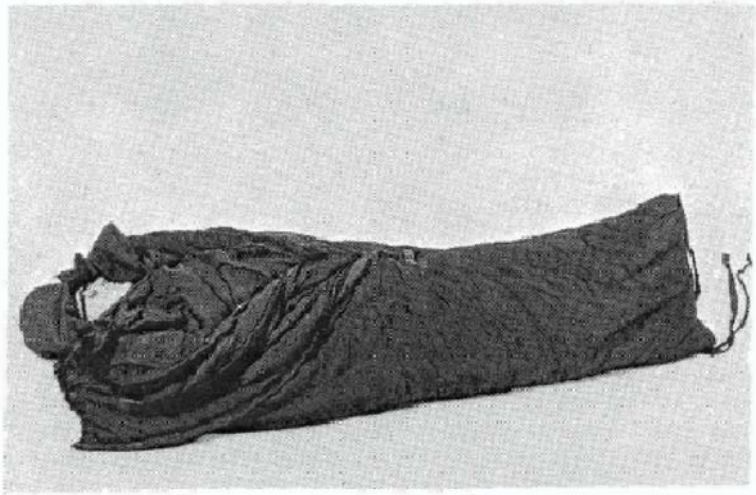


Figure 2-2 Bag, Sleeping, Cold Weather Complete with Hood and Liner

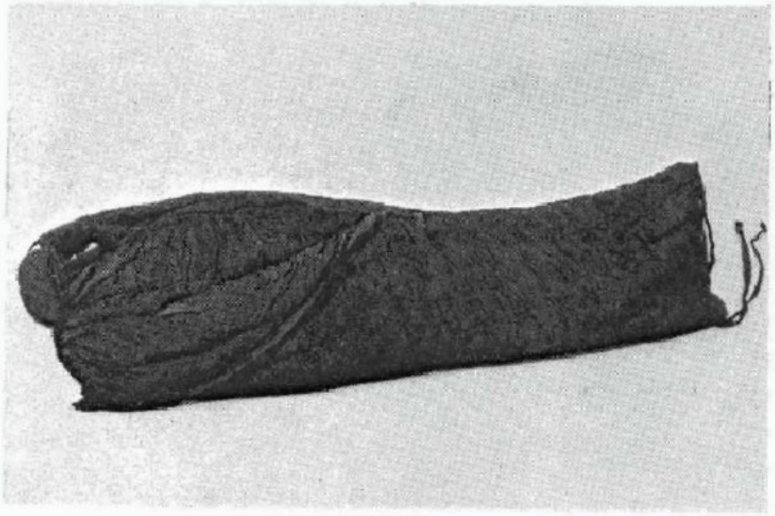


Figure 2-2A Bag, Sleeping, Cold Weather Complete with Hood and Liner

Figure 2-2B Bag, Sleeping, Cold Weather Complete with Hood and Liner

Figure 2-2C Sleeping Bag – Container

SLEEPING BAG SYSTEM - W8486-151419-D -
Manual Excerpt 170420
CAF Sleeping Bag, Rucksack, Compression Sack

CHAPTER 4 CLOTHE THE SOLDIER RUCKSACK (CTSR)

Section 1.0 Introduction

1.0.1 The Rucksack is designed to enhance sustainability by providing CF Personnel, conducting land operations, with load carriage for operations in conjunction with the Clothe the Soldier Tactical Vest.

Section 2.0 Description

2.0.1 The CTS Rucksack (CTSR) adopted the best of the latest in commercial design and technology to improve the soldier's capability to carry heavy loads, for prolonged periods, over difficult terrain. Unlike previous rucksacks (1964, 1982), the CTSR is an internal frame rucksack with a suspension system. The CTSR is designed to be custom fitted to each soldier. The CTSR sizing jig is used to take the necessary body measurements. The soldier will then be issued the proper Rucksack components.

2.0.2 The CTSR fitting and curvature jig has been designed to properly size the Rucksack (torso, shoulder straps, hipbelt) and to determine the individuals back curvature. It is critical for the CTSR to fit correctly for optimum performance, comfort and safety.

2.0.3 Two accessory 7 litre pouches, which can be attached in various locations, are also issued with the CTSR. Modular pouches from the SPS are also compatible with the Rucksack.

CHAPTER 4 RUCKSACK Cont'd

2.0.4 CTSR Component Sizes and colour coding

X Large	Large	Medium	Small

2.0.4.1 The CTSR component sizes are as follows:

- Four different Torso sizes Small, Medium, Large Extra Large (S, M, L, XL)
- Four different sizes of Hipbelt (S, M, L, XL)
- Three different sizes of Shoulder Harness (S, M, L)

Section 3.0 Sizing the Rucksack and its Components

3.0.1 As a result of the CTSR fitting jig it is possible to achieve 48 different sizing combinations for the CTSR. To determine the size of Torso length, shoulder strap and hip belt, the CTSR fitting jig must be used as these measurements are not based on height or weight. The CTSR fitting jig uses measurements based on the iliac crest and the C-7 vertebrae. In addition to the CTSR fitting jig the CTSR curvature jig provides the information necessary to shape the two vertical aluminium stays to the contour of the soldier's back. This allows for a custom fit of each CTSR.

3.0.2 **Proper fitting of the components (torso, hipbelt, and shoulder straps) and aluminum stay curvature is essential for operational effectiveness. Proper fitting allows loads to be carried efficiently, comfortably and safely in a wide variety of mission specific tasks.

3.0.3 The Fitting and Curvature Jigs functions are calibrated and directly related to the CTSR. The CTS Fitting Jig (Fig. 4-1) determines torso, hipbelt and shoulder strap sizing.

CHAPTER 4 RUCKSACK Cont'd

3.0.4 The CTS Curvature Jig (Fig. 4-2) is used to properly shape the two vertical aluminum stays to the contour of each soldier's back.

Fig. 4-1 - Fitting Jig

Fig. 4-2 - Curvature Jig

Section 4.0 Design Features

4.0.1 **BACK VIEW**

4.0.1.1 The CTSR is similar in design to recreational internal frame packs. Significant changes were made to address key issues related to function and durability. In order to withstand the severe military conditions, the CTSR had to be re-enforced i.e. militarized. This "militarization" of the pack was achieved through extensive user field trials and testing, and most importantly through deployments of the CTSR to operational theatres. Figure 4-3 outlines the basic components of the CTSR Back Panel.

CHAPTER 4 RUCKSACK Cont'd

Figure 4-3 – Back View

- ⓐ lid
- ⓑ name tag attachment
- ⓒ top handle
- ⓓ load stabilizer straps
- ⓔ load transfer buckles
- ⓕ shoulder straps (S,M,L)
- ⓖ adjustable sternum strap
- ⓗ quick release strap
- ⓘ back pad (S, M, L, XL)
- ⓙ Lumbar pad
- ⓚ hipbelt stabilizer strap
- ⓛ hipbelt (S, M, L, XL)
- ⓜ hipbelt load transfer rod strap
- ⓝ shoulder strap adjustment strap
- ⓞ load transfer rod (LTR)

CHAPTER 4 RUCKSACK Cont'd

4.0.2 FRONT VIEW

Figure 4-4 – Front View

- (a) top snowcuff with radio access
- (b) 3 daisy chains
- (c) centre compression strap
- (d) lid straps
- (e) bottom access pocket
- (f) storm collar
- (g) bottom cover / bottom cover buckles
- (h) bottom snowcuff
- (i) reinforced bottom
- (j) cargo strap loops
- (k) bottom handle and pocket

CHAPTER 4 RUCKSACK Cont'd

4.0.3 SIDE VIEW

Figure 4-5 – Side View

ⓐ daisy chains
ⓑ centre compression strap
ⓒ load transfer rod
ⓓ hipbelt stabilizer strap
ⓔ hipbelt
ⓕ hipbelt load transfer rod strap
ⓖ load transfer rod boot
ⓗ compression straps

CHAPTER 4 RUCKSACK Cont'd

4.0.4 **TOP VIEW**

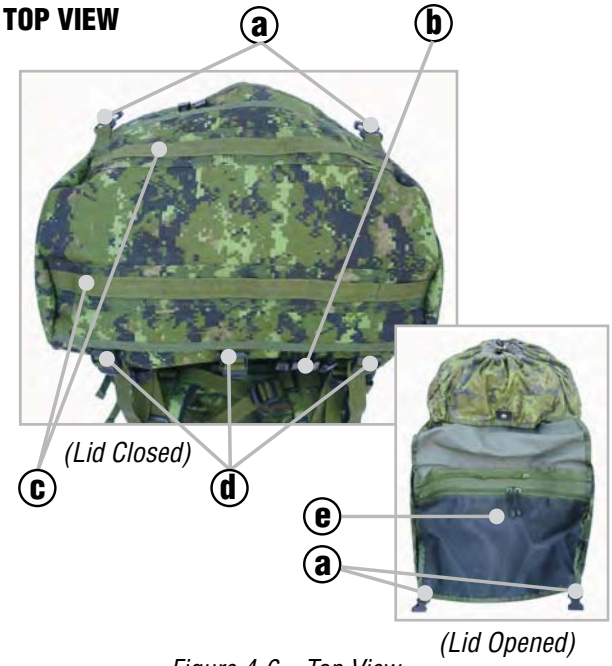


Figure 4-6 – Top View

ⓐ lid securing buckles
ⓑ access zipper for radio
ⓒ daisy chains
ⓓ lid adjustment straps
ⓔ mesh pocket - interior / exterior access

4.0.5 Daisy chain attachments (Figures 4-4, 4-5, 4-6) have been sewn to the top, sides and front of the Rucksack to provide additional carrying flexibility and capacity. The daisy chains are secured to the Rucksack with bartacks that are equally spaced to create loops that can be used to anchor or secure the two Rucksack Accessory Pouches. The Rucksack Daisy Chain attachment will also accommodate the Small Pack Regular Accessory Pouches, Regular Fanny Pouch, Quad Fanny Pouch.

CHAPTER 4 RUCKSACK Cont'd

4.0.6 INTERIOR (CUTAWAY) VIEW

Figure 4-7 – Cutaway View

4.0.7 SUSPENSION SYSTEM

4.0.7.1 Fig. 4-8 illustrates several of the hidden features of the suspension system

Figure 4-8 – Suspension System

CHAPTER 4 RUCKSACK Cont'd

A. Two vertical aluminum stays, removable and shapeable to back curvature (S, M, L, XL).
B. Load Transfer Rod (LTR), two replaceable fiberglass rods (S, M, L, XL).
C. Rigid foam frame sheet.
D. Horizontal Stay, removable.
E. Hipbelt (S, M, L, XL).
F. Hipbelt Load Transfer Rod strap, activates Load Transfer Rod (LTR).
G. Hipbelt Stabilizer strap.
H. Shoulder Straps (S, M, L).
I. Load Stabilizer strap.

4.0.8 ACCESSORY POUCHES

4.0.8.1 Two large 7 litre Accessory Pouches (modular) are issued with each Rucksack to provide exterior storage capacity. The Accessory Pouches can be attached to any Daisy Chain location (Lid, Side Panels, Front Panel). Modular pouches from SPS can also be used on the CTS Rucksack.

Figure 4-9 – Accessory Pouches

CHAPTER 4 RUCKSACK Cont'd

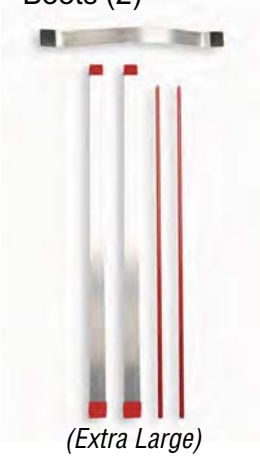
Section 5.0 Rucksack Assembly

5.0.1 All Rucksack part sizes (i.e. hipbelt, shoulder straps and Rucksack) are determined by the Rucksack Fitting and Curvature Jigs.

5.0.2 Tri-glide – A one piece buckle that allows strap attachment and minor adjustments.

Figure 4-10 – Tri-glide

5.0.3 Vertical Aluminium Stays (2), Horizontal Stabilizer Stay (1), Load Transfer Rods (2), Load Transfer Rod Boots (2)



(Extra Large)
Figure 4-11

Figure 4-12 - Load Transfer Rod Boots (2)

CHAPTER 4 RUCKSACK Cont'd

5.0.3.1 Insert vertical aluminium stays (2) (aluminium stays and load transfer rods are pre-installed on new rucksacks) and Load Transfer Rods (2) into sleeves as shown in the photograph below. Close Velcro over vertical aluminum stays.

Figure 4-13

5.0.3.2 Attach Load Transfer Rod Boots firmly, matching hook and loop Velcro. Seal the Velcro. Place black elastic bands over the Velcro joint to secure. See Figure 4-14.

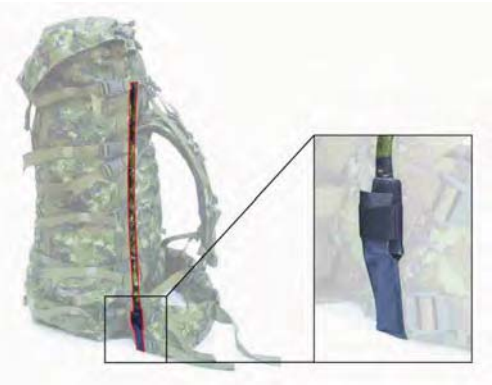


Figure 4-14

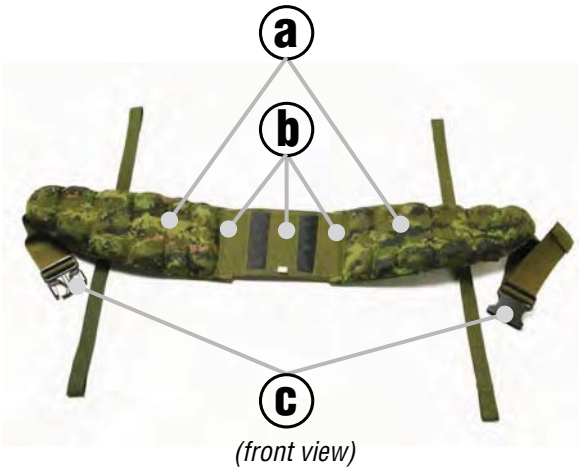
CHAPTER 4 RUCKSACK Cont'd

5.0.3.3 Open the Top Snowcuff and on the interior of the Back Panel locate a horizontal webbing sleeve. This sleeve is at the top of the two vertical aluminium stays and fits the Horizontal Stay (HS). To access the HS, open the HS sleeve Velcro closures as per fig. 4-15. The curve of the HS should be protruding into the interior of the pack. Please refer to fig. 4-15.

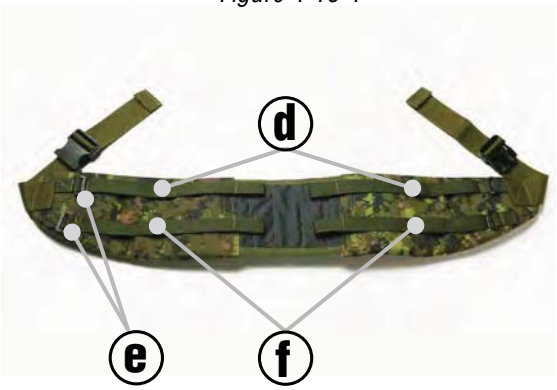
Figure 4-15

CHAPTER 4 RUCKSACK Cont'd

5.0.4 HIPBELT ASSEMBLY (S, M, L, XL)



(front view)
Figure 4-16-1



(back view)
Figure 4-16-2

- (a) moulded padding
- (b) hook attachment
- (c) 2" hipbelt buckle
- (d) hipbelt stabilizer straps
- (e) Common Loops for securing straps
- (f) Hipbelt Load Transfer Rod straps

CHAPTER 4 RUCKSACK Cont'd

5.0.4.1 Insert CTSR Hip Belt Assembly

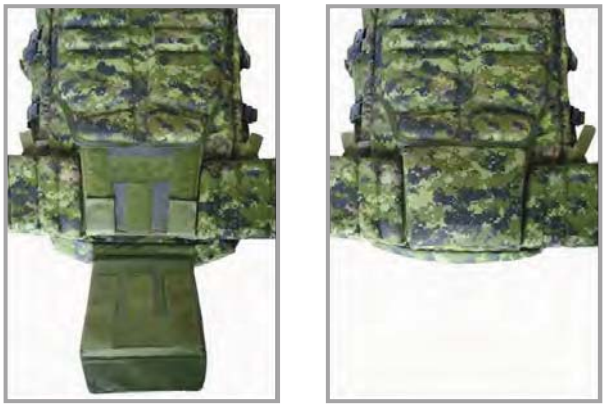


Figure 4-17

5.0.4.1.1 Lay the CTSR flat on the ground with the front facing down (back pad facing up) with the Velcro nametag at the top.

5.0.4.1.2 Orient the CTS hip belt and with the Velcro side facing up, with the size label located at the bottom of the hip belt (Horizontal line of belt towards top).

5.0.4.1.3 Insert Velcro portion in between CTSR and Frame Sheet.

5.0.4.1.4 Attach Velcro portion so that it is flush with the Frame Sheet.

5.0.4.1.5 Fold the lumbar pad over so that it is secure with the Velcro.

5.0.4.1.6 Thread the two Hip Belt Stabilizer straps and two Load Transfer Rod Straps to the corresponding ladderlock buckles attached to the sides of the CTSR (located beside the Load transfer Rods). Assembly of the Hipbelt is now complete.

CHAPTER 4 RUCKSACK Cont'd

5.0.5 SHOULDER STRAPS (S, M, L)

(front view)

Figure 4-18-1

(back view)

Figure 4-18-2

- (a) Rucksack attachment straps
- (b) load stabilizer straps
- (c) adjustable neck strap
- (d) load transfer buckles
- (e) D-ring
- (f) quick release mechanism
- (g) ladderlock
- (h) adjustable sternum strap

5.0.5.1

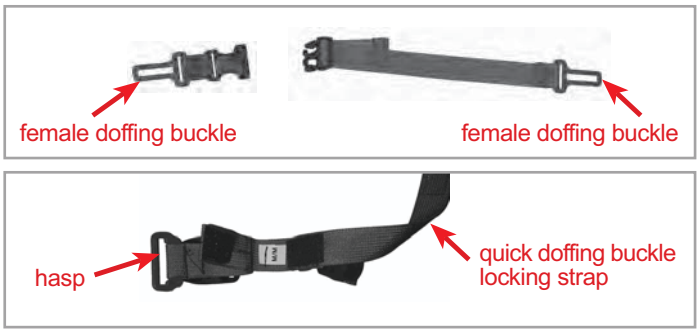


Figure 4-19 - Parts and Assembly of the Quick Release Mechanism

CHAPTER 4 RUCKSACK Cont'd

5.0.5.2 Attaching Quick Release Mechanism to Shoulder Strap

Hold the Quick Release Mechanism Strap so that the ladder lock is right side up, the Quick Release Barrel is on top and the small hook and loop fasteners are detached from each other.

Quick Release Mechanism

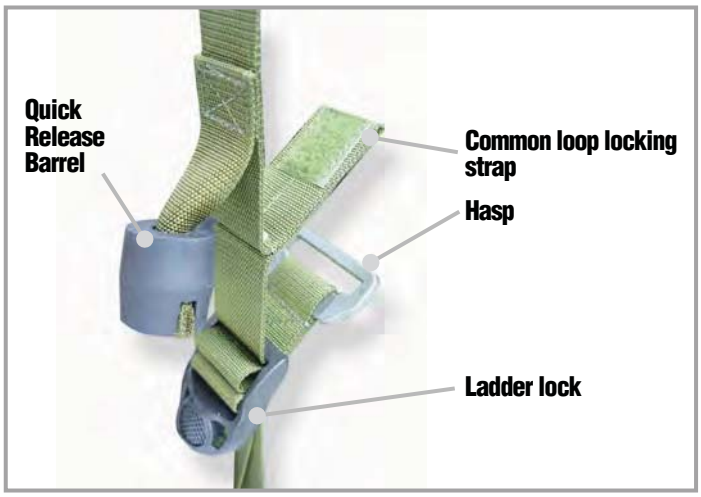


Figure 4-20 - Quick Release Mechanism Strap

CHAPTER 4 RUCKSACK Cont'd

5.0.5.3 Slip the Hasp on the Quick Release Mechanism Strap over the nylon Common Loop on the Shoulder Strap, holding in place with fingers.

Figure 4-21

5.0.5.4

- Thread the Common Loop locking strap of the Quick Release Mechanism strap with the 1" hook fastener through the nylon Common Loop (figure 4-22-a)
- Attach the 1" hook fastener to its matching 1" loop fastener, thus securing together the Hasp and the Common Loop. (figure 4-22-b).

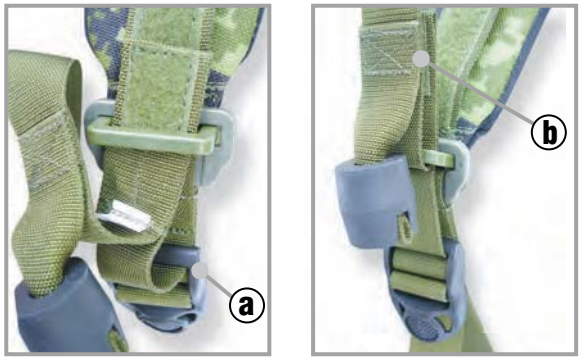


Figure 4-22

CHAPTER 4 RUCKSACK Cont'd

5.0.5.5 Place the female doffing buckle at one end of the Sternum Strap over the male doffing buckle while holding in place with fingers.

Figure 4-23

5.0.5.6 Thread the pointed end of the quick doffing buckle locking strap through the Adjustable Sternum attachment, pull completely through and attach the hook and loop fasteners together. This will secure the Sternum Strap to the Shoulder Strap and complete the assembly of the Quick Release Mechanism.

Figure 4-24-1

Figure 4-24-2

CHAPTER 4 RUCKSACK Cont'd

5.0.5.7 Place the Shoulder Straps on the CTSR by threading the Rucksack Attachment Straps through the metal tri-glides on the Rucksack and the Shoulder Strap as per Figure 4-25.

Figure 4-25

Figure 4-26

CHAPTER 4 RUCKSACK Cont'd

Section 6.0 Donning the Rucksack

6.0.1 Familiarize yourself with parts in Figure below.

Figure 4-27

ⓐ hipbelt buckle
ⓑ hipbelt Stabilizer straps
ⓒ hipbelt Load Transfer Rods straps
ⓓ shoulder strap adjustment straps
ⓔ sternum strap
ⓕ load stabilizer straps
ⓖ load transfer buckles
ⓗ adjustable neck strap

CHAPTER 4 RUCKSACK Cont'd

6.0.2 Prior to donning the CTSR loosen / unfasten the following straps (Fig. 4-27):

1. Unfasten the hipbelt buckle (a)
2. Loosen Hipbelt Stabilizer straps (b)
3. Loosen Hipbelt Load Transfer Rod straps (c)
4. Loosen Shoulder Strap Adjustment straps (d)
5. Unfasten the side release buckles on the Sternum Strap (e)
6. Loosen the Load Stabilizer straps (f)

6.0.3 Locate the top of your hipbone. (marked with X below)

Figure 4-28

6.0.4 Put the CTSR on your back and lean forward at a 60 to 70 degree angle.

Figure 4-29

CHAPTER 4 RUCKSACK Cont'd

6.0.5 Stay leaning forward for the next seven steps.

6.0.5.1 Move CTSR up or down – placing hipbelt so that the top of your iliac crest (Fig. 4-28) is centered in the middle of the hipbelt.

6.0.5.2 Firmly cinch the hipbelt buckle. (a) (Fig. 4-27)

6.0.5.3 Cinch the Hipbelt Stabilizer straps loosely and snugly. (b)

6.0.5.4 Cinch the Load Transfer Rod straps loosely. (c)

6.0.5.5 Firmly cinch Shoulder Strap Adjustment straps. (d)

Figure 4-30

6.0.5.6 Fasten Sternum Strap buckle and cinch. (e)

6.0.5.7 Cinch Load Stabilizer straps. (f)

Figure 4-31

6.0.6 Straighten upright and fine tune any adjustments that are not comfortable (tighten or loosen).

CHAPTER 4 RUCKSACK Cont'd

Section 7.0 Fine Tuning the Fit of Your Rucksack (Figure 4-27)

7.0.1 If there is a gap between shoulder and Shoulder Strap, try the following:

- Move Load Transfer buckle (g) to centre of shoulder or slightly forward (toward your chest).
- Loosen Load Stabilizer strap (f) and cinch Shoulder Strap Adjustment straps (d). Then re-cinch Load Stabilizer strap.

OR

- Loosen the Load Stabilizer strap (f) and slide Load Transfer buckle (g) forward or back until the gap reduces, then re-cinch Load Stabilizer strap (f).

7.0.2 Raise or lower the Sternum Strap so it is comfortable and reduces pressure on collar bone.

7.0.3 The centre of the Hipbelt should be over the iliac crest (x) Fig. 4-28.

7.0.4 If the CTSR is too high: loosen the Shoulder Strap Adjustment straps and the 2" hipbelt buckle and push pack down over hips.

7.0.5 If the CTSR is to low: start the process over again, and stay bent forward as you cinch all the straps.

Figure 4-32

CHAPTER 4 RUCKSACK Cont'd

7.0.6 Discomfort in hips or lower back: ease off Load Transfer Rod straps (c).

7.0.7 The Neck Strap is located between your head and the CTSR. This strap is best adjusted when the CTSR is on the person. A second person is needed to adjust this strap. Tighten or loosen the strap. The Neck Strap prevents the Shoulder Straps from separating or moving outward on your shoulders.

7.0.8 The Load Stabilizer straps are adjustable. To place more weight on your shoulders – tighten. To place more weight on your hips – loosen. If this strap is too loose, movement of the top of the CTSR may cause imbalance.

7.0.9 The Sternum Strap can be adjusted according to comfort. A tight Sternum Strap works the inner chest muscles. A looser Sternum Strap works the outer chest and shoulder muscles. Adjusting this buckle frequently (loosening, tightening) can help with comfort while marching.

7.0.10 If you are experiencing pressure points on your back or shoulders this is most likely from the vertical aluminum stays. Mark the location on the CTSR (using tape) where the pressure is occurring. Take out the aluminum stay(s) and change the curvature slightly in this area. This will ease off the pressure point.

7.0.11 Note: Research at Queen's University has shown that bent stays are more efficient then straight stays when protective plates are worn

CHAPTER 4 RUCKSACK Cont'd

7.0.12 The Load Transfer Rod transfers weight off your shoulders and onto your hips. As the Load Transfer Rod strap (A) is tightened the pressure travels up the fibreglass rod, causing an equal and opposite reaction at the top (B), up and off the shoulders. (Figure 4-33)

7.0.13 If you experience discomfort in your lower back area or hips, try releasing pressure on the Load Transfer Rod in small increments until comfortable.

Figure 4-33

CHAPTER 4 RUCKSACK Cont'd

Section 8.0 Doffing the Rucksack

ⓐ hipbelt buckle
ⓑ hipbelt Stabilizer straps
ⓒ hipbelt Load Transfer Rods straps
ⓓ shoulder strap adjustment straps
ⓔ sternum strap
ⓕ load stabilizer straps
ⓖ load transfer buckles
ⓗ adjustable neck strap

Figure 4-34

8.0.1 There are three basic methods of doffing the Rucksack; Normal doffing method, One Shoulder Strap quick doffing and Both Shoulder Straps quick doffing. The last two methods use a Quick Release Mechanism that enables soldiers to quickly doff the Rucksack.

1. Normal doffing method - This method is used when there is no urgency to doff the Rucksack. Loosen all straps a, b, c, e, and f (Figure 4-34). Undo the hip belt and sternum buckles and doff the Rucksack under control.

CHAPTER 4 RUCKSACK Cont'd

2. One Shoulder Strap doffing - This method is used when there is a sense of urgency with the need to have some control over the Rucksack and how it will land. **Warning** It is very important that you undo the hip belt buckle first. Detach the shoulder strap quickly by pulling the Quick Release Barrel (Fig 4-20) on either the left hand side or the right hand side. The Rucksack can then be rolled off the shoulders. Pulling the Quick Release Barrel on only the left or right side will allow the Sternum Strap to remain attached to the other side.

Figure 4-35

3. Both Shoulder Straps doffing - This method is used when the Rucksack must be urgently removed. **Warning** It is very important that you undo the hip belt buckle first . Pull both Quick Release Barrels (Fig 4-20) . This will allow the Rucksack to fall quickly and completely off the soldier's back. The Sternum Strap will fall off separately from the Quick Release Mechanism Straps (figure 4-35). Retrieve the sternum strap when it is safe to do so.

Note: The Rucksack will remain operational without the sternum strap in place.

Figure 4-36 – One side pull procedure

CHAPTER 4 RUCKSACK Cont'd

Section 9.0 Ideal Load Configuration (where to distribute the weight)

9.0.1 Access to your CTSR occurs in two locations. The top access is under the Lid and through the top Snowcuff. Loosen the drawcord for access. The second access location is through the Bottom Access Pocket. Release the drawcord of the outer Snowcuff Storm Collar and undo the Bottom Cover side release buckles (3). Pull back the Bottom Cover and open the Interior Snowcuff.

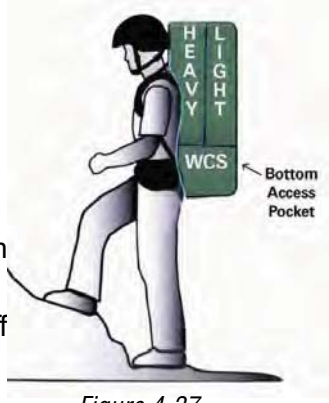


Figure 4-37

9.0.2 The CTSR can be divided into two compartments (top and bottom) using the Interior Divider. This interior divider is accessible through the top and bottom accesses. Assemble the divider using the Velcro on its four sections. Pull and secure the drawcord provided to close the divider. It will be easier to close the divider from the bottom access with the Rucksack empty.

9.0.3 The Internal Frame CTSR is designed to fit close to a soldier's body. The closeness of the fit moves the centre of gravity of the load closer to the body. A compressed -vs- uncompressed CTSR prevents loads from shifting and is more efficient and comfortable.

9.0.4 Configure your CTSR load as follows:

1. Place WCS in the Bottom Access Pocket.
2. When possible place heavier items closer to the back of the CTSR, lighter items to the front.

CHAPTER 4 RUCKSACK Cont'd

3. Try to keep your centre of gravity as close to your back as possible.

9.0.5 The CTSR has two Large (7.5 litre) Accessory Pouches. Modular components from the Small Pack System (2 Regular Accessory Pouches (5 litre), 2 Fanny Pack pouches (7.5 litre) can also be used on the Rucksack.

9.0.6 When possible it is best to configure the modular Pouches on the sides and top of the CTSR. Placing modular Pouches on the Front Panel increases the distance to the centre of gravity.

9.0.7 Exterior loads (i.e. shovels, mortars, fuel, etc.) can be attached to the daisy chains. Again, when possible, attach loads on the top and sides of the CTSR to keep the centre of gravity closer to the body.

9.0.8 Use the compression straps on the sides of the CTSR to stabilize the load. This will prevent weight from shifting and decrease the size of the CTSR.

9.0.9 Access for the radio antenna and head set is through the lid of the CTSR. An internal Radio Pocket pouch with straps to adjust height and secure the radio is located in the top of the CTSR.

9.0.10 There is one mesh pocket on the lid for storage of small items. This pocket is accessible from the outside of the lid or, when the lid is open, through the underside zipper.

9.0.11 Compression straps (3) on the lid allow for adjustment and help with compression of the pack.

CHECK THE FIT

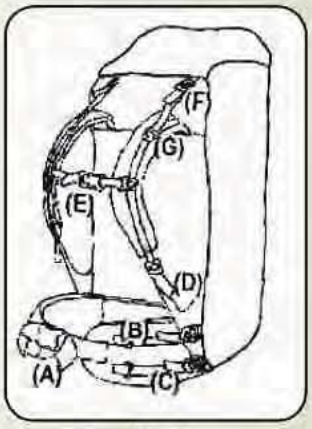


Fig. 1

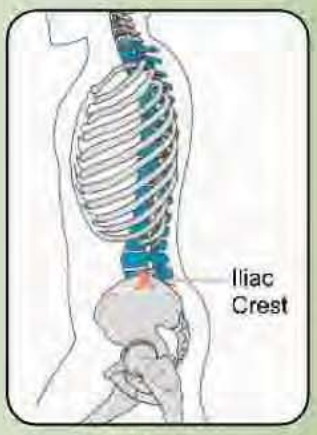


Fig. 2

1. Centre Load Transfer Buckle Fig.1 (G) on shoulder or slightly forward (toward your chest).

2. If there is a gap between shoulder and shoulder strap, try the following:

   a. Loosen Load Stabilizer Strap (F) and cinch Shoulder Strap Adjustment Straps (D). Then re-cinch Load Stabilizer Strap **gently**.

   OR

   b. Loosen the Load Stabilizer Strap (F) and slide Load Transfer Buckle (G) forward or back until the gap reduces. Then re-cinch Load Stabilizer Strap **gently**.

3. Raise or lower Sternum Strap (E) so it is comfortable and reduces pressure on collarbone.

4. The top of the hib belt should be 1"-2" above the illac crest (x) Fig. 2

   If the Rucksack is to high: loosen Shoulder Strap Adjustment Straps (D) and the 2" Hipbelt buckle (A) and push pack down over hips.

   If the Rucksack is to low: start the process over again, and stay bent forward as you cinch all the straps.

5. Discomfort in hips or lower back: ease off Load Transfer Rod straps (C).

CHAPTER 5 WATERPROOF COMPRESSION SAC (WCS)

Section 1.0 Introduction

1.0.1 The CTSR sleeping system holding compartment requires that the sleeping system be compressed to its minimum volume. A Waterproof Compression Sack is provided to reduce the volumetric size of the sleeping system by half.

Section 2.0 Description

2.0.1 Waterproof Compression Sack is provided for minimizing the sleeping system volume prior to inserting it in the CTSR. The WCS holds the sleeping system in a lightweight nylon sac. The WCS will compress the sleeping system by pulling the four compression straps alternatively. Once compressed, water-resistance is improved by matching the two plastic strips and rolling and securing the exterior snow cuff. Storage of the WCS is usually in the bottom of the CTSR using the Bottom Access Pocket.

Figure 5-1 - WCS in the uncompressed state

Figure 5-2 - WCS in the compressed state

CHAPTER 5 WCS Cont'd

Section 3.0 User Instructions

Figure 5-3

a. Stuff the WCS with compressible items (sleeping system) and close the inner snow cuff, ensuring to leave a small hole for air to escape.

b. Compress the WCS ensuring the top snow cuff is clear to allow air to escape.

**Note: Compression of the items is achieved by using the compression sack straps and applying pressure on the sack (The WCS does not have any release valves).

c. Proper closure of the WCS requires that the two plastic strips be folded onto each other and the material rolled down to the top of the sack.

**Note: At this time it is critical to have all the air out of the WCS since the soldier is now sealing the sack. This will create the seal.

d. Snap the lid straps into place and conduct the final compression using the compression straps.

CHAPTER 5 WCS Cont'd

Section 4.0 WCS Contents

*The CTS WCS is capable of carrying the following items:

- Sleeping Bag Outer
- Sleeping Bag Inner
- Sleeping Bag Liner
- Hood
- Bivy Bag

Ideal location of WCS is in the bottom of the CTSR using the Bottom Access Pocket.

Note: Should you need to add other items to the content of the WCS, always remove as much air as possible from the item prior to inserting in the WCS and always place the least compressible items i.e. Bivy Bag at the bottom of the WCS.

CHAPTER 6 PARACHUTE DROP BAG (PDB)

More info to come

CHAPTER 6 PARACHUTE DROP BAG (PDB)

More info to come

CHAPTER 7 TIPS & FREQUENTLY ASKED QUESTIONS (FAQS)

Section 1.0 Tips

1.0.1 Weatherproofing your Rucksack

Weatherproof your CTSR prior to using it in the field.

The cleaner your CTSR, the better the weatherproofing.

1.0.2 For Better Performance Follow These Rules

- Know the Equipment.
- Assemble the equipment properly.
- Keep each item in its proper place.
- Take the time to fit the TV to your body prior to actual field use.

Keep pockets and pouches securely closed with the side release buckle at all times to prevent loss of contents.

Section 2.0 FAQs

2.0.1 **Q:** I was given a Rucksack but with no fitting information. Is this ok?

A: NO. Every soldier needs to be fitted and sized using the fitting and curvature jig. All bases are supplied and trained to use this device.

2.0.2 **Q:** I need more then the two pouches supplied with the Rucksack. Are more available to me?

A: Yes. Your Small Pack comes with two pouches and two fanny packs that are compatible with the Rucksack. (Move location)

2.0.3 **Q:** How important is the bending of the stays?

A: Very important. Your back is curved. Having straight (unbent) stays means that there will be contact with only the high points on your back ie. Shoulder blades. This will cause pressure points. A correctly bent stay will give even pressure along your back with no pressure points. Your Rucksack will be much more comfortable.

CHAPTER 7 TIPS & FAQS Cont'd

2.0.4

Q: I do not carry a radio. Can I take out the radio pocket in the Small Pack and Rucksack to save weight?

A: No. The radio pocket in both items is sewn in permanently. The radio pocket can be very useful for a proper load configuration. The radio pocket is ideally located to hold heavy, small items suck as water, ammunition, etc. High and close to your back as in point 10.0

Section 3.0 Web Site

3.0.1

For more information, visit the Clothe The Soldier web site at www.dnd.ca/cts

CHAPTER 8 LOAD CARRIAGE SYSTEM (LCS) MAINTENANCE

Section 1.0 Weatherproofing your LCS - Small Pack & Rucksack

1.0.1 Weatherproof your LCS prior to using it in the field. The cleaner your LCS, the better the weatherproofing.

1.0.2 Your LCS is not waterproof. Use the CTS Waterproof Compression Sack to waterproof your sleeping system. The LCS's water resistance can be improved by seam sealing interior stitching holes.

1.0.3 To seal your LCS you need to turn it inside out. This is easier to accomplish with the two vertical stays, Horizontal Stabilizer Stay, Hipbelt and Shoulder Straps removed.

1.0.4 Follow all instructions on the bottles of seam sealer provided.

Section 2.0 Care and maintenance of the LCS - Tactical Vest, Small Pack & Rucksack

2.0.1 The LCS should be hand washed using mild household laundry detergent and a soft brush, and hung to dry.

2.0.2 The LCS should not have any exterior water proofing agents applied as these might affect the water resistance of the material.

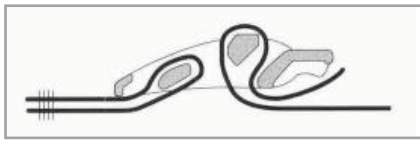
2.0.3 Seam sealer may be applied to the interior when extremely clean/new to promote water resistance.

2.0.4 Velcro should be kept clean.

CHAPTER 8 LCS MAINTENANCE Cont'd

Section 3.0 Buckles

3.0.1 Ladderlock - A one-piece buckle used for adjustment purposes.



Cutaway view of ladderlock with webbing

Figure 8-1

3.0.2 Side Release – A two-piece buckle that facilitates adjustment and quick release for attachment purposes.

Figure 8-2

3.0.3 Field Replaceable buckles (ladderlock and side release) The gap allows these two buckles to be put on webbing where failure/breakage of existing buckle has occurred.

Ladderlock
Figure 8-3-1

Side Release
Figure 8-3-2