

NEW SOUTH WALES FIRE BRIGADES

HARD KNAPSACK REGA HARD KNAPSACK EXTINGUISHER RECOMMENDED PRACTICE



BUSHFIRE / NATURAL HAZARDS SECTION SPECIALISED STATE OPERATIONS

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Warnings, Cautions and Notes

Throughout this manual, the reader will find statements titled **WARNING**, **CAUTION** or **NOTE** with a short piece of information following, generally no more than one sentence, highlighting a hazard or providing additional clarification, or both. Each of these statements has a particular meaning, as follows:

WARNING

A **Warning** indicates that **PERSONAL INJURY MAY RESULT** if recommended procedures are not carefully followed, and tells what to do to avoid such injury. Equipment may also be damaged.

CAUTION

A **Caution** indicates that **EQUIPMENT MAY BE DAMAGED** if recommended procedures are not carefully followed, and tells what to do to avoid such damage. Potential for personal injury is not expected.

NOTE

A **Note** provides **CLARIFICATION** of an operational procedure. Neither personal injury nor equipment damage is involved.

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Specific Equipment Warnings

 **WARNING**

Use both shoulder straps while wearing the hard knapsack. This will help ensure an even weight distribution of the knapsack on the body.

 **WARNING**

Never aim the hand-pump directly at a person's eyes or face.

 **WARNING**

Never lift or carry a weight greater than you are comfortable with. If you can't lift the Rega when filled, don't use it.

 **WARNING**

When the Rega is partly full, the contents will slosh from side to side. Be careful to maintain your balance.

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SECTION A: INTRODUCTION

1 Manual Structure

1.1 This manual consists of five sections:

Section A: Introduction

Section B: Equipment Fact Sheet

Section C: Operation

Section D: Maintenance

Section E: Appendix

2 General

2.1 This manual instructs firefighters and Community Fire Unit members in the use of the Rega Hard Knapsack extinguisher.

2.2 The hard knapsack is used in bush fire operations and mop-up.

2.3 Additives such as Bushfire Fighting Foam (BFFF) can be used with the hard knapsack, if authorised and appropriate.



Figure 1 Rega Hard Knapsack in operation

SECTION B: EQUIPMENT FACT SHEET

1 Technical Specifications

Tank capacity:	16 litre
Water filling inlet:	105 mm diameter
Material of the tank:	UV stabilised polythene
Water jet reach:	up to 9 m
Flow rate:	1.25 litres per min
Dry weight:	3.8 kg
Fill weight:	19.8 kg
Dimensions (empty):	450 x 385 x 175 mm

2 Hard Knapsack Components

2.1 The hard knapsack has two major components:

- A 16 litre tank made of UV stabilised polythene. The tank has a basic harness with padded shoulder straps, and a 105 mm water inlet with cap. The outlet from the tank into the hose has a brass filter for use with dirty water.
- A hose with a hand operated pump. The pump has an adjustable brass stop cock which can be set either for a water jet or a water spray. The hose and pump are stored in recessed slots in the tank body.

2.2 The hard knapsack is issued fully assembled.



Figure 2 The Rega Hard Knapsack

SECTION C: OPERATION

1 Health and Safety

1.1 Protective clothing

1.1.1 Firefighters must wear:

- suitable eye protection,
- helmet,
- long-sleeved workshirt,
- bushfire jacket (firefighters),
- duty trousers,
- boots,
- gloves.

1.1.2 Where necessary, firefighters must also wear fire tunics and overtrousers.

1.1.3 CFU members must wear:

- helmet,
- CFU overalls,
- long-sleeved shirt and trousers,
- CFU boots,
- gloves,
- goggles and dust mask as required.

1.2 Hard knapsack

1.2.1 Use the hard knapsack only for the purpose for which it has been designed.

1.2.2 Use both shoulder straps while wearing the hard knapsack. This will help ensure an even weight distribution of the knapsack on the body. Operating the hard knapsack with only one shoulder strap will produce unnecessary strain on the upper body and can result in over balancing.

WARNING

Never aim the hand-pump directly at a person's eyes or face.

1.3 Lifting & carrying the knapsack

- 1.3.1 Due to OH&S regulations, the hard knapsack should be filled with 12 litres. This provides a 16kg, one person, lift. If necessary, put the filled knapsack on a fence or the side of a truck and step into the straps. If necessary, have a workmate help you fit the knapsack.
- 1.3.2 Do not fill to a greater weight than you are comfortable carrying.
- 1.3.3 Do not run while carrying the hard knapsack.
- 1.3.4 If you can't lift the hard knapsack when filled, do not attempt to use it.

 **WARNING**

When the hard knapsack is partly full, the contents will slosh from side to side. Be careful to maintain your balance.

1.4 Bushfire Fighting Foam

- 1.4.1 Bushfire Fighting Foam (BFFF) is a powerful detergent which can remove skin oils. Containers of concentrate should be handled carefully and be kept properly sealed to prevent spillage.
- 1.4.2 Gloves, eye protection and long sleeves should be worn when mixing BFFF. Wash your hands and face after using BFFF.

 **CAUTION**

BFFF can pollute the environment. The concentrate should not be handled near, nor be allowed to enter, watercourses.

 **WARNING**

Do not drink from tanks that have BFFF added.

2 Operations

- 2.1 Before use, inspect the hard knapsack. Check connections don't leak. Check the operation of the hand-pump. Check that the plunger and stop cock are lubricated.
- 2.2 Remove the filler cap. Fill the tank.

CAUTION

The tank has a filter, but to ensure continued operations, use the cleanest water practical.



Figure 3 Hard knapsack main components

- 2.3 Place arms through the shoulder straps and adjust for comfort.
- 2.4 Operate the pump and turn the stop cock for either a jet or fan spray pattern. The spray pattern can be adjusted by slightly turning the stop cock.
- 2.5 Changes in temperature can result in a pressure buildup even when the hand-pump is not operated. Do not aim the pump directly at a person's eyes or face.

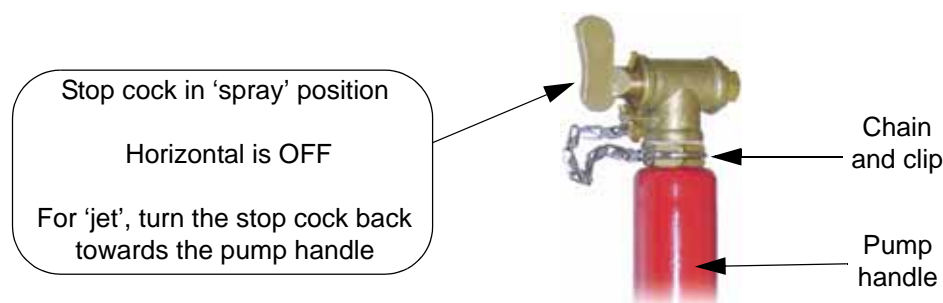


Figure 4 The nozzle

NOTE

Short pump strokes of 10 to 12 cm give an easy, comfortable operation.

3 Using Bushfire Fighting Foam

- 3.1 Bushfire Fighting Foam (BFFF) is a blanketing and cooling agent added to water to improve firefighting efficiency. BFF works by:
- interrupting radiant heat from the flames,
 - cooling fuel,
 - isolating fuel from oxygen in the air.
- 3.2 BFFF should only be used when authorized.
- 3.3 Mix BFF in the following strengths for the purposes indicated.

Table 1: BFFF concentrate

Concentration	Amt concentrate	Purpose
0.1 – 0.25%	16 – 40 ml per Rega tank	Mop-up, penetrates surfaces
0.25 – 0.5%	40 – 80 ml	Initial suppression of bushfires
0.75%	120 ml	Formation of back burn line
1 – 3%	160 – 450 ml	Property protection barrier. BFFF clings to vertical surfaces

 **WARNING**

Gloves, eye protection and long sleeves should be worn when mixing BFFF. Wash your hands and face after using BFFF. Do not drink from tanks that have BFFF added.

SECTION D: MAINTENANCE

1 After Use

- 1.1 Drain the tank and flush with clean water. Wipe clean the brass filter inside the tank. Operate the pump several times to flush the filter, hose and pump with clean water.
- 1.2 If required, wash the outside of the tank, and the shoulder harness, straps and buckles, with water and dilute detergent.
- 1.3 If required, wash the hose, hand-pump and brass attachments with water and dilute detergent. Do not use abrasive or scouring cleaners. When you wash the hand-pump, dry it and re-grease the piston shaft and the nozzle stop cock.
- 1.4 Vaseline or clean grease is sufficient for lubricating the piston shaft and stop cock.
- 1.5 Allow the tank to dry in a warm, airy environment. Do not dry in direct sunlight.
- 1.6 Do not store in direct sunlight.

 **CAUTION**

Even though the tank is made of a UV stabilised material, long exposure to sunlight will weaken it.

2 Storage

- 2.1 Ensure the tank is clean and dry. Open the inlet cap and leave the tank to stand so that the interior can dry out. Leave the shoulder harness at full extension, ready for wear. Stow as required.

 **CAUTION**

Do not stow the harness with heavy or oil operated equipment. Heavy equipment may puncture the tank. Leaking oil will degrade the tank and harness material.

3 Monthly Check

- 3.1 Inspect the knapsack for cracks or signs of damage. Ensure the filter is clean.
- 3.2 Check the pump for smooth operation. If necessary, apply a small amount of vaseline or clean grease to the piston rod.
- 3.3 Check the stop cock on the nozzle for smooth operation. If necessary, apply a small amount of vaseline or grease. Use CRC Powerlube or equivalent if necessary.
- 3.4 To ensure pump pressure:
- check the filter is clean,
 - check the plunger O-rings are not worn or damaged,
 - check the plunger valve is not blocked,
 - check the hose tail valve is not blocked,
 - check the hose connections are tight.
- 3.5 Check the nozzle assembly is clean and undamaged.
- 3.6 Ensure buckles on shoulder straps are correctly positioned. Buckles should be positioned close to the tank anchoring points, as in Fig 3.

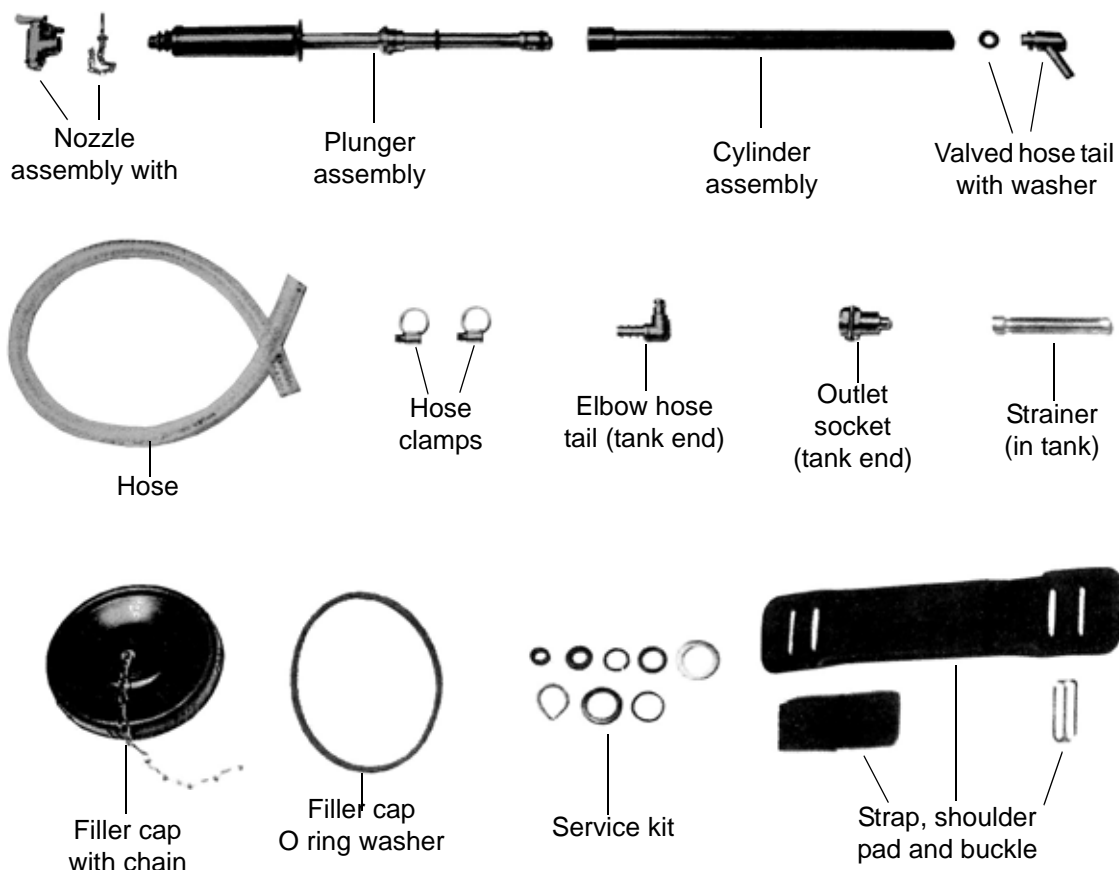


Figure 5 Rega Hard Knapsack components

4 Troubleshooting

Table 2: Troubleshooting matrix

Defect	Cause	Remedy
Not pumping water	Filter clogged	Clean
	Plunger O-rings worn	Replace
	Plunger valve blocked	Clean
	Hose tail valve blocked	Clean
	Nozzle assembly blocked	Clean
Imprecise spray pattern	Nozzle obstruction	Clean / replace
Difficult to move pump	Lack of piston lubrication	Lubricate with vaseline
Leaking from hose connections	Loose hose clamps	Tighten or replace
	Worn hose	Replace
Leaking from pump	Plunger valve obstruction	Clean
	Plunger O-rings worn	Replace
	Loose stuffing box cap (screws plunger assembly into cylinder)	Tighten
Leaking from rear of pump	Loose hose tail	Tighten

5 Resupply

5.1 Initial supply:

- for firefighters is through *NSWFB Supply Catalogue*,
- for CFUs is through Bushfire/Natural Hazards Section.

5.2 For firefighters, replacements parts are available through the *NSWFB Supply Catalogue*.

5.3 For CFUs, supply of replacement parts and maintenance is through local NSWFB stations. Resupply of the entire unit, where necessary, is through Bushfire/Natural Hazards Section.

SECTION E: APPENDIX

1 Contact

- 1.1 Any queries regarding the equipment or procedures described in this document should be directed to Bushfire / Natural Hazards Section, Greenacre.

2 References

‘Instructions and Service Kit Details – Rega’, Instruction Card – 109721, Rega.

‘Section K: Bush Fire Equipment’, *NSWFB Supply Catalogue*, Volume 2, © NSWFB, 2004

‘Topic 4, Section 2: Fire Fighting Procedures’, *Firefighters Training Manual*, Volume 2, NSWFB, 1996.

‘Recommended Practice: Wearing of Uniforms and Protective Equipment’, NSWFB.

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