



OPERATION MANUAL
FOR
RESCUE AIR CUSHIONS
SERIES A/K - J3/K
MEDIUM PRESSURE (14.5 PSI / 1.0 Bar)

12 SEPTEMBER 2011

PN 22-887071

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VALIDATION CERTIFICATE

TECHNICAL MANUAL TITLE

OPERATION MANUAL FOR RESCUE AIR CUSHIONS SERIES A/K - J3/K MEDIUM PRESSURE (14.5 PSI / 1.0 Bar)

TECHNICAL MANUAL NUMBER

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DATE

04 December 2009

CONTRACT/NO.**I-VALIDATION**

Except as stated in II, the technical manual identified above has been satisfactorily validated in accordance with all requirements of the applicable contract. The technical manual is hereby certified to be accurate and complete, and the information, instructions, text, and illustrations conform in all respects to the applicable general and detailed specifications.

II - EXCEPTIONS**EXCEPTIONS**

NONE

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SIGNATURE OF PUBLICATIONS QUALITY ASSURANCE OFFICER

SIGNATURE ON FILE

DATE

QAP20/002/B

CHANGE RECORD

Change No.	Date	Title and/or Brief Description	Signature of Validating Officer

FOREWORD

This technical manual conforms to Military Specifications MIL-M-38784 General Style and Format Requirements, MIL-M-7298 Commercial Equipment Technical Manual and MIL-M-15071 Equipment and Systems Content Requirements for Technical Manuals

All pertinent data relative to the Rescue Air Cushion is contained herein without specific reference to other publications. Refer to the table of contents for the arrangement of the contents within this publication.

TABLE OF CONTENTS

This manual consists of one volume arranged in four chapters as follows:

Chapter 1 - Safety Summary

Chapter 2 - Introduction

Chapter 3 - Operational Use

Chapter 4 - Care And Maintenance

SAFETY SUMMARY

The following are general safety precautions to be adhered to during the set-up, operation, and disassembly of the SERIES A/K - J3/K Air Cushion Systems. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

Ensure equipment is used ***only*** by trained and qualified personnel.

All personnel using and assisting must wear proper safety equipment, including head, eye, hand, body, and foot protection.

All non-essential personnel must be kept clear of the operating area.

Always block and secure the load as it is being lifted.

Never work under a load that is supported only by Air Cushions.

Remain clear of operating area of Air Cushions.

Never operate the Air Cushions without a safety controller.

OPERATIONAL USE

1. Safe lifts depend on preservation of stability.
2. Successful lifts depend on careful assessment and observation.
3. Take all the normal precautions against the danger of outbreak of fire, such as laying out **charged** line of hose or foam branch as appropriate.
4. Look carefully to assess the situation to determine priorities. Think how safe lifts may be achieved, then only, ACT.
5. Determine the best location for inserting air cushions. Avoid contact with sharp or jagged surfaces, particularly on side walls; hot exhausts should be covered with a folded fire and heat resistant blanket.
6. Ensure delivery hoses are well-laid and not "kinked". Position cushions as far as possible under load but, if this is impractical, inflate to obtain clearance, pack and reposition cushions.
7. Ensure valves are in "off" position. Connect delivery hoses to controller maintaining clear line to respective cushions.
8. Air sources other than regulated cylinder supply should not exceed 145 PSI / 10 Bar.
9. Before actually inflating, consider the effect of lift on **stability**. Remember, a three-point lift is the safest, i.e. one side or end of a vehicle in contact with the ground and two air cushions wherever possible.
10. Commence inflation by activating appropriate valves, balancing air input by paying attention to controller gauges
11. Crib and block as lift proceeds, taking care to see cribbing is placed so that, if necessary they can support the load.
12. Web loops are provided on A-D Rescue Air Cushions to secure the cushions.
Galvanized steel rings are supplied on D2 and J3 Rescue Air Cushions to secure the cushions.

13. Paratech 14.5 PSI / 1.0 Bar cushions have been successfully used to raise submerged vehicles, small cruisers etc. Exercise caution with respect to thrust and strength of bulkheads.

14. Extension delivery hose lengths should be made available for 12. and 13.

15. **The following precautions should always be observed and are repeated here for emphasis:**

Ensure equipment is used ***only*** by trained and qualified personnel.

Series A/K - J3/K Cushions should never be inflated without the control equipment supplied.

Keep clear of load unsupported by blocks during lifting operations.

Operator should be positioned away from the direction of anticipated ejection path.

Do not use hoses or inflation port for retrieving or re-positioning cushions.

The following warnings appear in the text of this manual and are repeated here for emphasis:

WARNING
ALWAYS OPEN HIGH PRESSURE AIR SOURCE SLOWLY. FAILURE TO DO SO MAY DAMAGE REGULATOR

WARNING
ALWAYS INFLATE RESCUE AIR CUSHIONS SLOWLY

WARNING
MAKE SURE ALL VALVES ARE IN A CLOSED POSITION BEFORE YOU TURN ON YOUR AIR SOURCE. THIS WILL REDUCE RISK OF ANY UNCONTROLLED LIFT.

INTRODUCTION

The Paratech Series A/K - J3/K (14.5 PSI / 1.0 Bar) Medium Pressure Air Lift Systems are specially designed for Fire Service use and are mainly intended for the rescue of trapped personnel and a variety of operational situations encountered at road accidents, aircraft crashes, collapsed tunnels or trenches, where conventional jacking methods may be difficult or impossible to apply without lengthy preparation. The Air Cushions are particularly useful on soft, irregular or rubble strewn ground, during snowy or icy conditions.

The broad surfaces of Series A/K - J3/K cushions ensure their suitability for exerting uniformly distributed lift pressure against accepted weak parts of vehicles e.g. sides, roof, wings, hood, trunk, etc., light aircraft, rescue of animals bogged down in pits or ponds. The height of lift enhances access possibilities for medical attention or extrication after ensuring chocks are in position.

WARNING
ALWAYS INFLATE AIR CUSHIONS SLOWLY TO MINIMIZE CHANCE OF SHIFTING

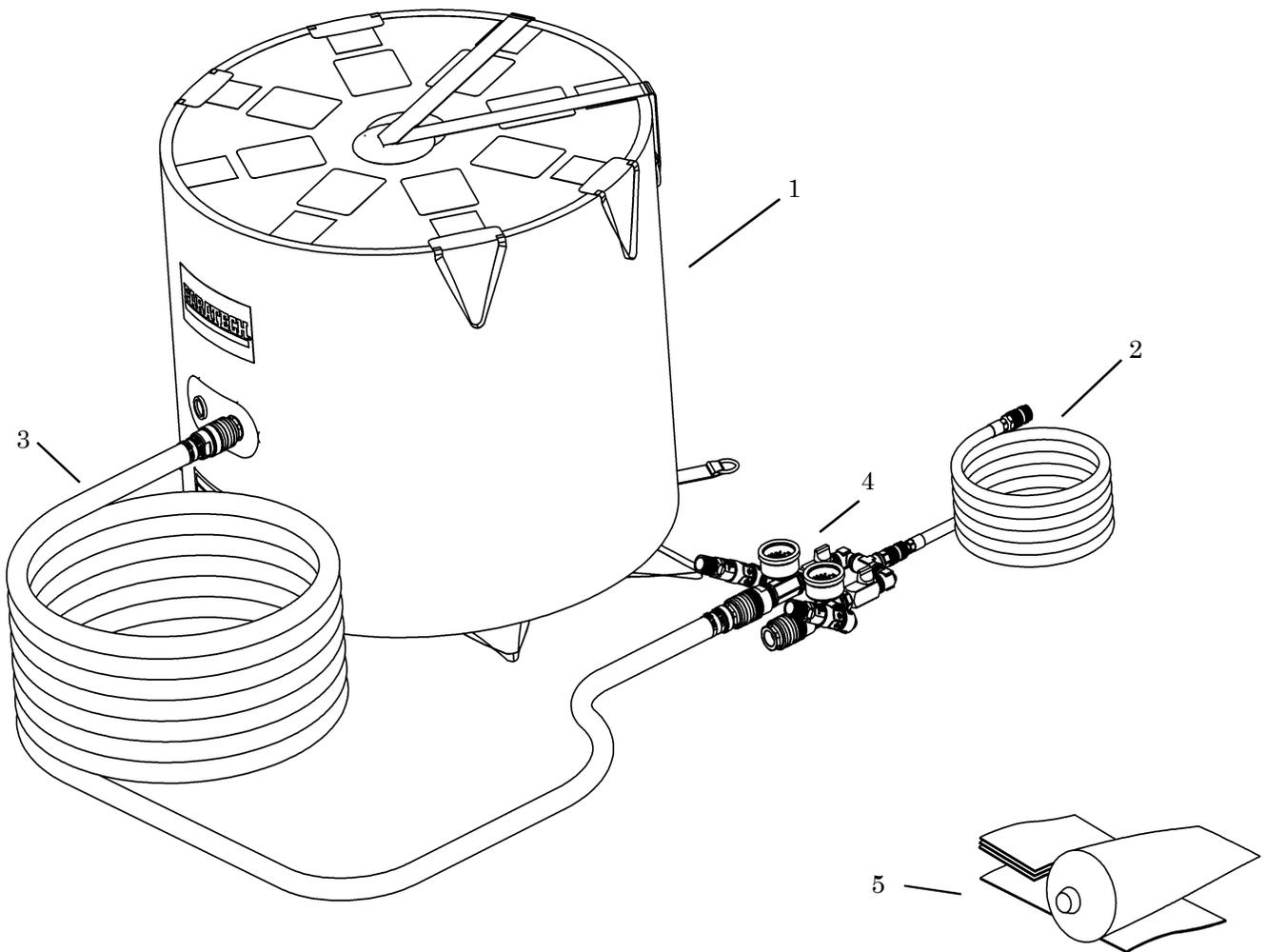
Data

Type		A/K	B/K	C/K	D/K	D1/K	D2/K	J3/K
Part Number		22-887005/K	22-887010/K	22-887015/K	22-887020/K	22-887025/K	22-887030/K	22-887035/K
Diameter	ins.	24	30	36	48	48	48	60
	cms.	61	76	91	122	122	122	153
Lift @ Max. Pressure	lbs.	6560	10,250	14,761	26,241	26,241	26,241	41,000
	kgs.	2976	4650	6697	11,906	11,906	11,906	18,597
Maximum Pressure	psi	14.5	14.5	14.5	14.5	14.5	14.5	14.5
	bar	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Height Inflated	ins.	17	23.3	24	40	48	60	78
	cms.	43	59	61	100	122	153	198
Height Deflated	ins.	2	2	2	4	4	4	4
	cms.	5	5	5	10	10	10	10
Air Requirement	cu. ft.	10.4	22.0	31.6	106	146	188	382
	ltrs.	295	650	895	3010	4200	5600	10,800
Weight Packed	lbs.	35	38	50	56	65	70	104
	kgs.	15	17	22	25	29	32	47

PARATECH SERIES A/K - J3/K RESCUE AIR CUSHION SYSTEM

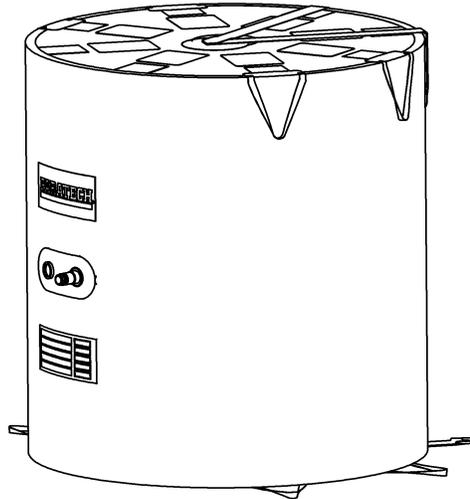
COMPONENTS:

1. Series A/K - J3/K Air Cushion (system includes 2 cushions)
2. Air Hose 3/8in (10mm) dia. x 16ft (4.9m) black P/N 22-890513
3. Air Hose 1in (25mm) dia. x 20ft (6.1m) red P/N 22-887400 and 22-887401 20ft (6.1m) blue
4. Dual Controller with Gauges and Safety Relief Valves P/N 22-887300
5. Repair Kit
6. Carrying Valise (not shown)



Repair Kit
Tube of Adhesive
Assorted Patches
60 Grit Emory Cloth

PARATECH SERIES A/K - J3/K RESCUE AIR CUSHION



Working Surfaces.....	3-ply Neoprene-Coated Belt (0.2 in. / 5 mm. nominal thickness)
Inflation Port.....	Molded Threaded Fitting 1 ^{1/16} - 12
Inlet Nipple	P/N 22-887467
Restraint Webs.....	Nylon Web 2 in. / 51 mm. wide (9500 lb. / 4309 kg. breaking strain)
Side Wall.....	Heavy Coated Neoprene/Kevlar Fabric (coated both sides)

PARATECH SERIES A/K - J3/K DELIVERY HOSE

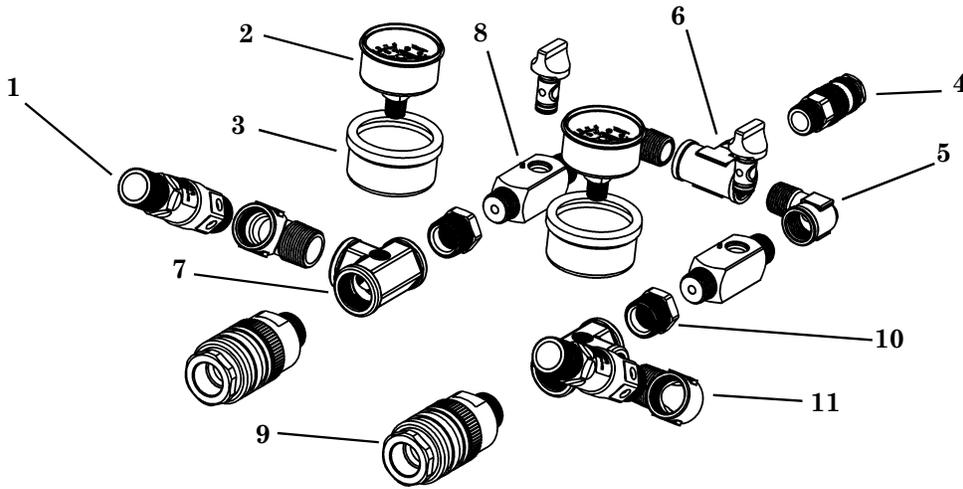
1 in. / 25 mm. Bore, fabric reinforced Thermoplastic hose. Max. Working Pressure @ 70° F (21° C) - 150 PSI (10.3 Bar)

Service Temperature Range - 14° F (-26° C) to 150° F (65° C)

Standard lengths supplied: 20 ft. / 6 M., 40 ft. / 12 M., and 60 ft. / 18 M.

3/8 in. / 10 mm. diameter hose supplied in 16 ft. / 5M. length.

PARATECH DUAL CONTROLLER P/N 887305



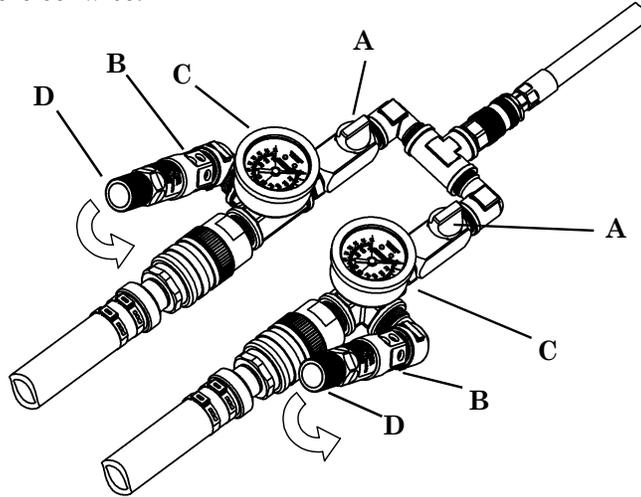
<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	22-890998	Relief Valve, 14.5 psi (1.0 bar), 3/4" NPT	2
2	22-890626	Gauge, 30 psi (2 bar)	2
3	22-890697	Neoprene Gauge Cover	2
4	22-890710	Coupling, 1/2" Male	1
5	22-890656	1/2" St. Elbow	2
6	22-890655	1/2" Tee	1
7	22-890659	3/4" NPTF Tee, Gauge	2
8	22-890450	Valve, 1/2" NPTM X 1/2" NPTM	2
9	22-550360	Coupling, 3/4" NPTM	2
10	22-890662	Bushing, 3/4" Male X 1/2" Female	2
11	22-890654	3/4" St. Elbow	2

DUAL SAFETY RELIEF AND CONTROL VALVE (CONTROLLER)

is used to inflate and deflate the air cushions. The two pressure relief valves are factory pre-set at 14.5 PSI (1.0 Bar) preventing over inflation of bags. There are separate control valves to safely operate 2 bags independently.

The operation of the Controller is as follows:

1. The supply hose is connected from the CONTROLLER to an air cushion. Air will flow through the supply hose and the air cushion will inflate. Now operate the inflation valves. The Inflation Valves (A) are turned clockwise allowing air to flow to the bag. To stop the inflation, turn Inflation Valve counterclockwise.



2. If the operation of the Controller allows air pressure to increase into the red zone, the safety relief valves (B) will open, preventing over inflation.

*Notice the Operating Gauge (C) Dial-White/Go-Red/No Go.

3. To deflate the air cushion with the Dual Controller, turn the Deflation Valves (D) counterclockwise to allow air to escape from the valve assembly.

NOTE: CUSHION WILL DEFLATE SLOWLY. IT IS DESIGNED IN THIS MANNER SO THAT THERE WILL NOT BE ANY QUICK MOVEMENTS TO HEAVY LOADS WHICH COULD THROW THEM OFF CENTER AND CAUSE DAMAGE OR INJURY.

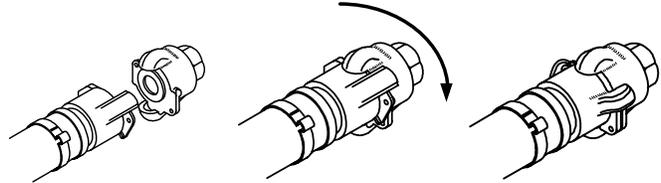
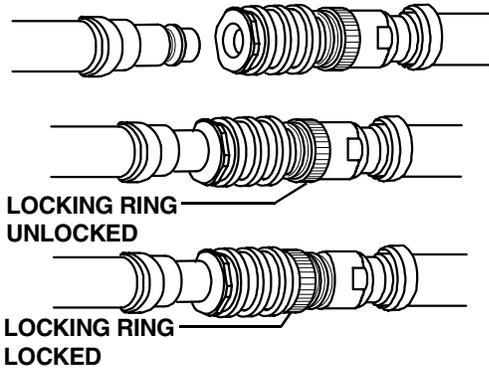
4. Now operate the CONTROLLER with two (2) cushions connected. Practice operating the cushions simultaneously and alternating, inflating and deflating. As you can see, the operation of the air cushion system is simple.

Note: When using more than one air cushion the use of different colored air hoses enables the operator to rapidly identify the air cushion that is connected to each side of the control valve.

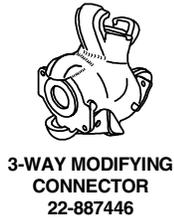
HOSES:

Hoses are used for delivery of air supply to the system. All hoses are equipped with Paratech's field replaceable dual locking couplings (locking prevents accidental disconnection of fitting) or twist-lock claw couplings. Additional lengths of hose can be attached to permit remote operation or additional bags and accessories.

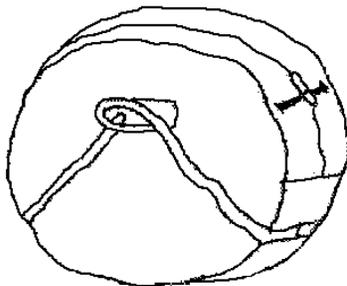
The illustrations below exhibit the various twist-lock claw couplings and the Paratech field replaceable dual locking coupling and their operations.



Apply a thin coat of Chemplex 710 Silicone Grease (P/N 22-670404) to neoprene gaskets to ease assembly of Twist-lock Claw Couplings.

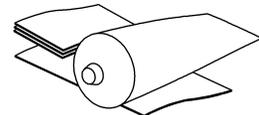


SERIES A - J3 AIR CUSHION CARRYING VALISE



P.V.C. Coated Nylon
Toggle Fastening
2 in. / 51 mm. wide Nylon
Carrying and Reinforcing Web

Repair Kit
Tube of Adhesive
Assorted Patches
60 - Grit Emory Cloth



OPERATIONAL USE

The following notes are intended as guidance:

1. Safe lifts depend on preservation of stability.
2. Successful lifts depend on careful assessment and observation.
3. Take all the normal precautions against the danger of outbreak of fire, such as laying out **charged** line of hose or foam branch as appropriate.
4. Look carefully to assess the situation to determine priorities. Think how safe lifts may be achieved, then only, ACT.
5. Ensure the side walls are folded inwards in regular fashion and that the upper working surface is "square" with the lower by reference to the web loops placed at quadrant positions.
6. Determine the best location for inserting air cushions. Avoid contact with sharp or jagged surfaces, particularly on side walls; hot exhausts should be covered with a folded fire and heat resistant blanket.
7. Ensure delivery hoses are well-laid and not "kinked". Position cushions as far as possible under load but, if this is impractical, inflate to obtain clearance, pack and reposition cushions.
8. Ensure valves are in "off" position. Connect delivery hoses to controller maintaining clear line to respective cushions.
9. Air sources other than regulated cylinder supply should not exceed 145 PSI / 10 Bar.
10. Before actually inflating, consider the effect of lift on **stability**. Remember, a three-point lift is the safest, i.e. one side or end of a vehicle in contact with the ground and two air cushions wherever possible.
11. Commence inflation by activating appropriate valves, balancing air input by attention to controller gauges.
12. Crib and block as lift proceeds, taking care to see that cribbing is placed so that, if necessary, they can support the load.
13. Web loops are provided to "hang" cushions between shuttering, collapsed trenches, or vehicles, skips etc., tight to walls.
14. Paratech 14.5 PSI / 1.0 Bar cushions have been successfully used to raise submerged vehicles, small cruisers etc. Exercise caution with respect to thrust and strength of bulkheads.
15. Extension air delivery hose lengths are available
16. **The following precautions should be observed:** Ensure equipment is used only by trained personnel. Series A/K -J3/K Cushions should never be inflated without the control equipment supplied.

Keep clear of load unsupported by chocks during lifting operations. Operator should be positioned away from the direction of anticipated ejection path.

Do not use hoses or inflation port for retrieving or re-positioning cushions.

CARE AND MAINTENANCE

ROUTINE, PERIODICALLY, AND AFTER OPERATIONAL USE:

Paratech Series A/K - J3/K Air Cushions are constructed to a standard which effects a minimum burst pressure of three times working pressure, irrespective of size, the largest cushion in the range, the Type J3/K, being selected as the minimum factor.

This design criterion is corroborated and certified by an independent source.. Each cushion will have a label placed prominently on the cushion giving the following information;

1. Maximum Working Pressure
2. Date of Manufacture
3. Serial Number
4. Paratech Logo
5. Series Identification

A Log Card, serially numbered, shall be issued, carrying particulars of the Works Acceptance Test as initial entry.

The following Maintenance and Test Procedure should be observed:

QUARTERLY

Check control equipment as detailed under item heading. Couple up and inflate cushions to working pressure, checking audible relief function with gauge read-out on controller.

Check delivery hose connections with brush and soapy water.

Visually inspect cushions for integrity of seam adhesion.

The glue around the edges of the cushion is there to seal the material. If there are foamy patches where air is SLOWLY bubbling out, that means the cushion needs to be resealed.

This DOES NOT affect the operation or integrity of the cushion.

AFTER OPERATIONAL USE

After drills and operational use, air cushions should be inflated to approximately 2 PSI / .14 Bar and thoroughly washed down using warm, soapy water. Wash down carrying valise, ensuring no grit or gravel adheres to inner surface.

Check side walls thoroughly for evidence of scuffing by abrasion.

Note: The strength of the side wall fabric is essentially the nylon core. Using brush and soapy water, check for leaks, concentrating on the side wall. Mark off for repair action (see Repair Instructions). After repairs are effected, inflate to approximately 2 PSI / .14 Bar and check integrity of repairs using brush and soapy water.

If side panels have tears or abrasions and nylon core is damaged more than 1 in. / 25.4 mm. in either direction, return cushion to Paratech Incorporated.

Proceed on the basis of a quarterly drill.

STORAGE

Air cushions in valise should, where possible, be stowed on appliance with flat side on floor of locker, ensuring no damage is caused by proximity to other pieces of equipment.

CARE AND MAINTENANCE

REPAIRS

Thoroughly clean surface around damaged area and mating surface of patch with fine emery paper.

Apply three coats of adhesive from repair kit to mating surfaces, allowing each coat to become tacky before applying the next. Press patch firmly into position and remove any air bubbles by using a spatula. Apply even pressure over patch by a suitable weight or clamp. Remove and lay flat in repair area and allow to cure overnight at room temperature 68 degrees F (20 degrees C).

Hoses

Keep couplings clean and dry.
Broken hose must be re-coupled or replaced.
Inspect for any cracks or nicks.

Dual Safety Relief and Control Valve (Controller)

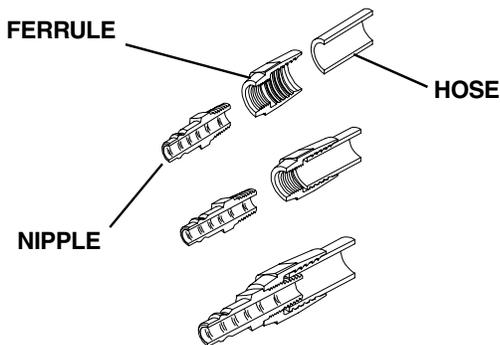
Keep couplings clean and dry.
Replace broken gauges.
Tighten gauge screws.

Pressure Regulator

Inspect inlet nipple and seat for tightness and damage.
Check for bent gauges, dials, indicator, case screws, cracked lens.
Check for overall tightness and damage.

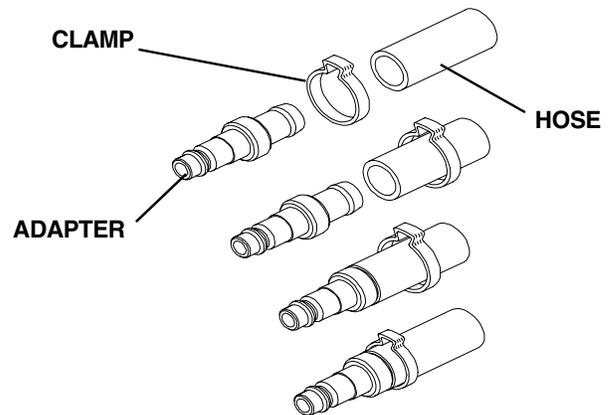
NIPPLE REPLACEMENT:

3/8" High Pressure Hoses



1. Gather hose and fittings.
2. Cut hose end squarely.
3. Install ferrule by threading counter-clockwise.
Leave 1/16 in. / 1.6 mm. space between hose end and ferrule inside shoulder.
4. Install nipple to ferrule - turning clockwise until seated.

1" Low Pressure Hoses



1. Gather hose and fittings.
2. Cut hose end squarely.
3. Slide clamp over the end of the hose, then back along the hose.
4. Insert adapter into the end of the hose until the shoulder of the adapter seats against the hose end.
5. Slide clamp back down the hose and tighten in place.

