



Owner's manual

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Notes:

Dear Customer,

Congratulations on your purchase of a Real X harness and container system! The Real X is the most advanced harness/container system available on the present market. Standard features include throw-out hand deployed main pilot chute, wingsuit friendly canopy deployment system, anti-twist D-bag, anti-twist riser housing, free fly friendly pin closures, step-in leg straps, active cut-in lateral webbing and unique harness construction with an innovated bungee system. This type of harness is very flexible and is not restricting the user even when the leg straps are done up, it also keeps the rig very comfortably "glued" on your back in any case.

The Real X is supplied with a MarS MPAAD reserve pilot-chute and a free-bag which features a pouch for secure stowing of lines and zero thickness where the closing loop passes through it, eliminating the need for any preliminary fid or preliminary pull-up cord when packing the canopy into it. This also prevents any of the canopy fabric from coming into contact or interfering with the closing loop.

When you buy a Real X, you are buying more than a container system; you're buying innovation, quality and reliability which with proper care and use will last for a lot of years. It is the purpose of this manual to provide you the information necessary to care for and use your Real X properly. It is our hope you will enjoy your Real X as much as we enjoyed designing and manufacturing it for you.

An FAA certified rigger with current skills should be able to assemble and pack the Real X by following the instructions in this manual. Real X It is the most "RIGGER FRIENDLY" system on the market.

The purpose of this manual is to familiarize the rigger and prospective user with the functions, packing procedures, maintenance and other features of the Real X harness/container system. It is NOT intended to be a course in parachute jumping or rigging. This manual should be read and understood by anyone who intends to use a Real X system for any kind of skydiving, however, it is the responsibility of the owner to be sure that the Real X is correctly assembled, packed, maintained and used. It is also the jumper's own responsibility to assure that he is qualified for participation in skydiving activities. Should any aspect of the information contained in this manual be unclear to you - or should you have any questions or concerns about your Real X which are not answered by this manual - Do NOT hesitate to contact MarS Parachutes Inc at the address below or on the back cover of this manual prior to jumping the Real X.

# **WARNING**

## **Skydiving is a hazardous activity that can result in injury or death!**

Parachutes sometimes malfunction even though they are properly designed- built- assembled- packed- maintained and used! The results of such malfunctions are sometimes serious injury or death!

If you use your Real X- or allow someone else to use it - you are acknowledging skydiving risks and accepting the fact that the Real X and/or its components may malfunction!

If you are not willing to accept the risks of skydiving - or if you are not willing to accept the possibility of that your Real X or its components may malfunction and perhaps cause you to be injured or killed- then you should reconsider your involvement in skydiving!

Training and/or experience are required to lower the risk of serious bodily injury or death!

Never use the Real X unless you have read and understand this warning – and you'd been properly trained and you fully understand how to use this equipment or you have read and fully understand all appropriate manuals, and packing instructions!

To lower the risk of death or serious bodily injury - canopy damage - container damage and hard openings - never exceed the lowest of maximum deployment speeds which are recommended for any of parts of your parachute (container, main canopy, reserve canopy)!

For your safety we do not recommend assembling with the Real X any reserve parachutes which are not TSO 23 D certified.

The information and specifications in this manual were in effect at the time of printing. The MarS Inc., however, reserves the right to change the Real-X at any time without notice or warning and without incurring any obligation.

By using this rig, or allowing it to be used by others, the buyer waives any liability for personal injuries or other damages arising from such use.

## **ALTERATIONS/MAJOR REPAIRS**

MarS Inc does NOT authorize alterations to any MarS harness & container system. This includes harness re-sizing. Alterations must be made by the manufacturer. Major repairs must be made either by MarS Inc, a designated MarS Service Centre, or an appropriately rated and certificated FAA rigger or foreign equivalent. For further info or clarification, contact MarS Inc or a MarS Service Centre.

# MarS INC.

## CUSTOMER SERVICE POLICY AND LIMITS

### ***Harness and containers***

MarS Inc will provide no charge repair service for repairs that MarS Inc. has determined to result from defects in material or workmanship for a period of twenty four months from the date of purchase. Date of purchase and proof of purchase must be supplied to MarS Inc. by the customer with the item in order to be repaired free of charge.

### ***Safety***

MarS Inc will perform all Mandatory service bulletins, repairs, or modifications due to SAFETY concerns free of charge.

### ***Unauthorized modifications/alterations***

MarS Inc will charge for repair service when the damage is caused by unauthorized modification or alteration of the product. MarS Inc reserves the right to refuse to repair any product so modified or altered.

### ***Improper use***

MarS Inc will charge for repairs that results from improper use or from abuse such as exposure to chemicals, saltwater, improper washing, improper packing, excessive exposure to sunlight, or negligence on the part of the user (i.e. jumping already damaged equipment).

### ***Limits***

MarS Inc reserves the right to refuse service on equipment for which materials and / or manufacturing patterns and specifications no longer exist.

### ***Configuration***

Articles sent in for repair should be sent in with all parts. MarS Inc may request and require additional information pertaining to the product.

### ***Accessory part - replacement***

MarS Inc will recommend replacement of component parts based on inspection when safety is a factor due to normal wear and tear or maintenance of the product.

### ***Product improvement***

Product improvements will be available as an option to customers.

## REAL-X PART LIST

- HARNESS/CONTAINER
- MAIN RISERS
- MAIN CONTROL TOGGLES
- MAIN DEPLOYMENT BAG WITH BUNGEEES
- MAIN PILOT CHUTE AND BRIDLE
- CUTAWAY HANDLE
- RESERVE PILOT CHUTE PV-038 WITH BRIDLE AND "RX" FREE-BAG FOR RAM-AIR RESERVE *(Only the MarS PV-038 reserve pilot chute may be used with the REAL-X harness/container system. Do not substitute any other pilot chute. Only the "Real X" free-bag may be used when packing a ram-air reserve canopy into the REAL-X harness/container system.)*
- RESERVE RIPCORD *(Only REAL-X reserve ripcords can be used)*
- RESERVE CONTROL TOGGLES
- MAIN CLOSING LOOP
- RESERVE CLOSING LOOP (MPAAD)
- ONE EXTRA CLOSING LOOP (MAIN)
- ONE EXTRA HARNESS BUNGEE
- HOOK KNIFE
- RESERVE PACKING DATA CARD
- REAL-X OWNER'S MANUAL
- PULL UP



All REAL-X are manufactured ready to accept any AAD available on the market including MPAAD.

DO NOT ASSEMBLE WITH THE REAL-X HARNESS/CONTAINER ANY PARTS WHICH ARE NOT MANUFACTURED OR/AND APPROVED BY MarS Inc FOR THE REAL-X HARNESS/CONTAINER.

## FEATURES OF THE REAL-X

The following is a list of features that set the REAL-X apart from other harness and container systems. Please feel free to contact us if you have any questions or need further elaboration regarding these attributes.

### - ***REAL-X Harness***

This is the most advanced harness system which makes a new step in harness construction. It contours the jumper's body tightly as a glove while allowing maximum comfort and freedom of movement in the air as well as on the ground and in the plane. The Real-X harness bungee system holds the leg straps in the same position and keeps the container firmly on your back without restricting any movements with the best of comfort. It allows maximum body mobility without compromising total body fit.

### - ***Pressure Moulded Back Pad***

Real-X is the first harness/container system with a pressure moulded backpad. A pressure moulded back pad is made to contour your back precisely and allow full range of movement. The backpad profile is designed like a human spine. The surface shape conforms to a backs anatomy the best it can. Combined with Real-X harness it creates incomparable flexibility and comfort with brilliant rig adhesion to your back.

### - ***Yoke***

The contoured yoke brings the harness over the shoulders and curves inward over the chest, which provides the most efficient placement of the emergency handles. This design also prevents the harness from slipping off the shoulders, should you have narrow shoulders.

### - ***Chest Strap***

The chest strap is designed to provide the maximum in upper harness protection while protecting the cable housings.

### - ***Cutaway Cable Housings***

Our guides provide a clean channel for the housings to float upward during high load situations. These guides also make it very difficult to misroute the cutaway cables.

### - ***External Riser Covers***

These tuck-tab riser covers proved *the most successful* tab/pocket design on the market. It is the best in riser protection. It is designed to lower the possibility of self popping the covers to minimum and allow easy riser deployment when needed.

### - ***Secondary Riser Cover***

Even in the highly unlikely event of an external riser cover opening during a freefall, the secondary riser cover makes it almost impossible for a riser or toggle to escape until the right time has come.

### - ***Main Pin Protection***

The main pin cover flap is integrated into the #1 closing flap and tucks upwards into itself for maximum protection against external forces as like on many other modern rigs around the world. Both the main and reserve pin covers are designed to conform better to the container. This ergonomic design helps eliminate protruding corners or edges that can catch on doorjamb, bulkheads or other such objects.



**- Reserve Pin Protection**

The reserve cover flap utilizes three tuck tabs to remain virtually immovable, without interfering with the reserve activation process.

**- Reserve Pilot-chute PV 038**

Pilot-chute PV 038 highly increases deployment speed and reliability of the reserve parachute. It's equipped with conical spring with bottom diameter 140mm and top diameter 70 mm. The spring has minimal force 176N (18kg, 40lbs). Due to the conical shape it has a very low packing volume. The great benefit of the conical shape is a much better adaptation for passing through reserve flaps – after pulling out the reserve ripcord the pilot-chute is almost unstoppable. The entire energy of the spring is concentrated into a small area and the resistance created by friction is insignificant.

**- Absolute Zero Bridle Exposure**

The Real-X, configured for BOC totally eliminates bridle exposure and the need for Velcro-type fasteners on the bridle cord as well as any other additional bridle covers

**- Anti-twist Deployment Bag**

Stowing the lines on the edge of the deployment bag is creating a swing movement while the lines are being unstowed from the rubber bands during parachute deployment. It's in danger of accidental twisting the deployment bag when the force on the rubber bands is uneven. Instead of stowing the lines on the edge we chose a system of stowing lines on top of the deployment bag flap and the deployment bag is placed to the container with pilot chute bridle up and lines on the bottom. This deployment system is virtually eliminating the swing when the deployment bag is leaving the container as well as danger of accidental twists created by uneven tension during deployment. Also it makes the Real-X the right choice for wingsuit jumps!

**- Open Pocketed Corners**

Both the main and reserve pack trays utilize closed pocketed corners at the bottom of the tray and open pocketed corners at the top of the tray. This serves to ensure optimum bag positioning during deployment, helping to protect against bag tumble or spin as it leaves the container. The corner of the main tray also serves as a pocket for the main bridle, virtually eliminating bridle exposure during freefall.

**- Quality**

Just as is true of all of our containers, the Real-X is constructed to exacting standards, using only the finest materials available. Even with nominal care, your Real-X will perform faithfully for years.

**- Guarantee**

MarS Inc is totally committed to you, our customer, through the quality and performance in the harness and container systems we design, build and deliver. We will back our products 100% from the day it leaves our factory. You will find our after sales service to be as comprehensive as our customers have come to expect from MarS Inc.

# HOW TO USE THE REAL-X

It is the responsibility of the owner to possess the specific knowledge required to make a safe skydive, including how to use their equipment properly. This kind of knowledge can only be gained by personal professional instruction.

It is essential that someone jumping a Real-X for the first time practice normal and emergency procedures on the ground. Practicing normal and emergency procedures should be performed using training aids that simulate the equipment to be used in the air.

## PRE-JUMP EQUIPMENT CHECK

The pre-jump equipment check should be done in logical order. The commonly used way is to check the gear from back to front, top to bottom.

**Switch on the ADD first thing.**

### BACK – TOP TO BOTTOM

- AAD
- Shoulder covers
- Reserve pin
- Main parachute pin and kill line window
- Pilot chute bridle and free fly handle if used.

### FRONT – TOP TO BOTTOM

- 3 Ring system
- Cutaway handle
- Reserve handle
- Leg straps

## BACK – TOP TO BOTTOM

### - AAD

Make sure the AAD has turned on and is functioning properly.

### - Shoulder Covers:

Check if the shoulder covers are closed in correct order and the tuck tab is stowed in its pocket. Popping shoulder cover could be caused by twisted riser underneath (refer to main parachute packing instructions).

### - Reserve pin

Open the reserve pin cover flap by grasping the sides of the flap and pulling straight up. **Do not grasp or pull up the bottom edge of the flap.** This will cause the end of the flap to curl up, becoming permanently deformed and cause serious problems with function of the reserve pin cover flap.

CORRECT



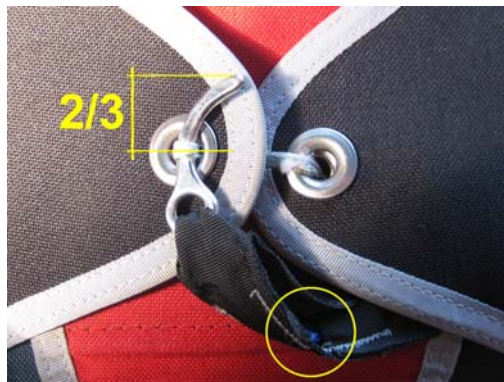
WRONG



Check the pin; it should be straight and seated well into the closing loop. Slide the reserve ripcord cable back and forth in its housing to be sure it moves freely.

### - Main parachute pin and kill line window

Lift the main container pin cover flap and check the curved closing pin. Pin should be about 2/3 in the loop and facing up. Make sure the bridle comes from bottom and goes back to bottom without any twists.



The kill line window indicates if the pilot chute was properly "cocked". Collapsed pilot chute will more likely result in pilot chute in tow malfunction. Be aware the kill line must be correctly marked to give you the true indication.

### - Pilot chute bridle and free fly handle.

Ensure the bridle is tucked under the right flap and no part of the bridle is exposed. If your pilot chute has free fly handle make sure its tuck tab is stowed under the bottom of the right flap (refer to main parachute packing instructions).

## FRONT – TOP TO BOTTOM

### - 3 Ring system

Make sure the 3-Ring system is assembled correctly and free of any dirt or any alien objects. If any wear is found, consult the manufacturer or a rigger before use.

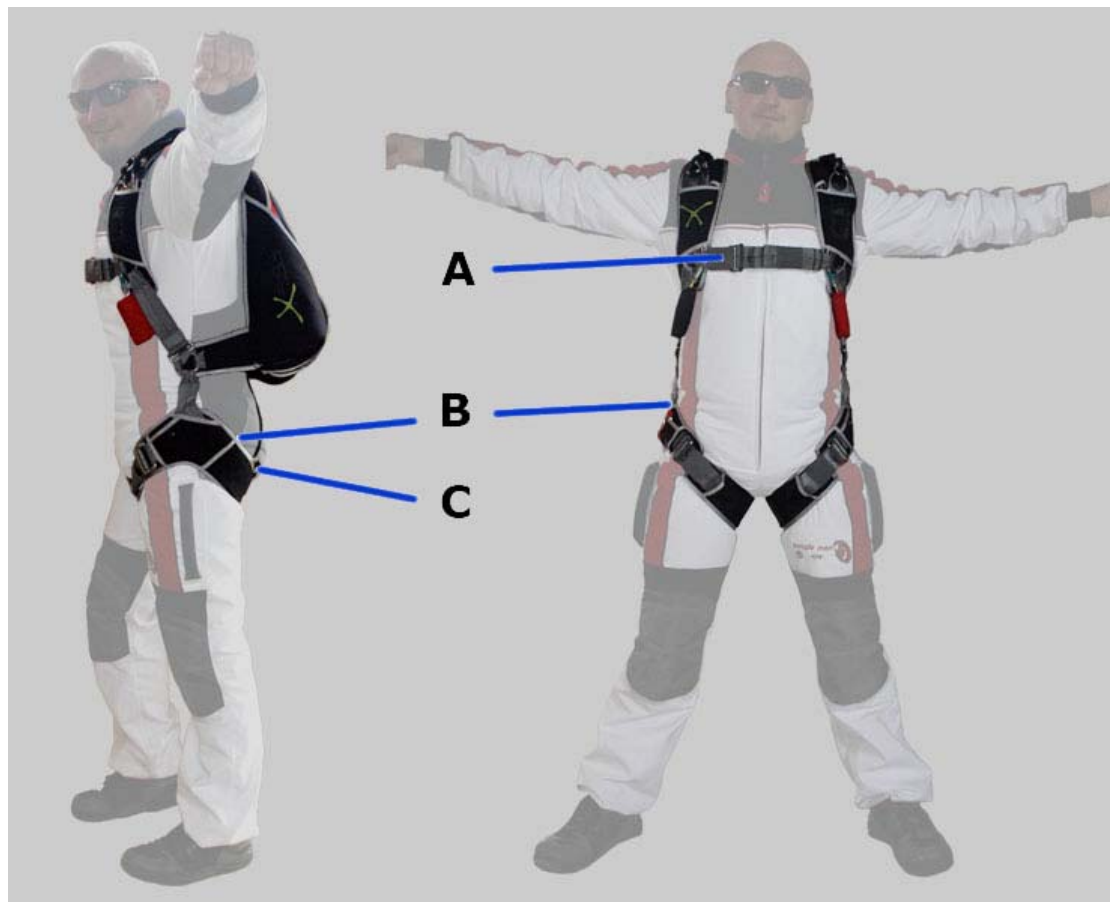
### - Cutaway handle and reserve handle

Visually check the position of the cutaway handle and reserve ripcord handle. Removing handles from their housings too often causes unnecessary wear and tear on the Velcro fastener, do so just if you suspect a problem.

### - Leg straps

Remove any twists you find from the leg straps. Webbing will significantly lose its strength if twisted and will cause discomfort, in the worst case it might cause damage to the harness or its partial failure. Also check if the bungee system is worn or damaged.

## FITTING AND ADJUSTING YOUR REAL-X HARNESS



### A) Chest Strap

Threading the chest strap:

The chest strap goes through the adjuster from behind, around the sliding bar and back through between the bar and the end of the adjuster. Stow the excess under the elastic keeper. Unstowed excess might cause slipping of the chest strap in free fall.



– **adjustment for Free Fall:** Make the chest strap tight. Correct position is roughly shoulder width or a little bit tighter (fig. A). The chest strap should not restrict you from arching – try it prior boarding the aircraft. The harness is designed to allow you make it tight and still allow you full body movement.

- **adjustment for Canopy Flight:** As soon as you finish with your opening routine make the chest strap as loose as possible. Loosening of your chest strap together with collapsing and stowing the slider away provides better stability and significantly increases flight performance of your canopy.

DO NOT UNDO THE CHESTRAP UNTIL YOU HAVE LANDED - you might need to perform cutaway in emergency situation.

**WARNING:** Chest strap **MUST** be done up prior to exit until landing. Failing to do so might result in falling out of the harness on opening and severe injuries and/or death. We strongly recommend doing up your chest strap prior to boarding the aircraft.

### B) Leg Straps

Make sure you routed the webbing correctly before tightening. Tighten the leg straps comfortably tight. You should be able to put your fingers under the leg strap without too much effort. Loose leg straps might cause discomfort during canopy flight and make it feel like the harness is too big.

Stow the excess strap through the elastic keepers and then stow the excess strap in the pockets on the leg pads. This will ensure that the leg straps don't flap around in the air while you are in freefall.

### C) Bungee System –

Set the length of the bungee on both sides the same. A couple of tries prior to the first jump will give you an idea how tight the bungee system should be.

Because it is an individual thing, to determine the preferred tightness use following:

- When standing straight there should be a bit tension on the bungees.
- If you can lift the container easily of your back in a sit position the bungee system is set too lose.
- If the bungee system restricts you from getting into sit position the bungee system is too tight.

# MAIN PARACHUTE ASSEMBLING AND PACKING INSTRUCTIONS

This chapter deals with the procedures for packing the ram-air main canopy into the Real-X harness/container system. Assembly and packing of the main must be done by an FAA certified rigger/parachute technician or by the person making the jump.

**Attaching the Toggles**  
**Attaching the Risers**  
**Attaching the Pilot chute**

**Setting the Brakes**  
**Pilot chute Kill Line Instructions**  
**Lines Stowing**  
**Riser Flaps Closing Sequence**  
**Container Closing Sequence**  
**Pilot Chute Folding and Stowing**

**Pre-Jump Inspection**

**3 Ring Cutaway System**  
**Correct 3 Ring Configuration**  
**3 Ring Pre-Jump Inspection**

Carefully inspect the main canopy, suspension lines, control lines, slider and grommets, connector links, etc., before assembling it with the risers. Replace or repair any worn or damaged parts. Also inspect the deployment bag, bridle and pilot chute.

Attach the main canopy to the main risers, being sure that the canopy is facing the same direction as the harness/container system and that each suspension line is clear from its attachment point all the way through the slider grommet to the connector link without passing around any other line. Be sure the control lines are clear from the trailing edge of the canopy through the slider grommets and through the ring guides on the rear risers to the control toggles. Each control toggle must be **SECURELY** tied to its control line at the location specified by the canopy manufacturer. Also be sure that the connector links are tight enough so that they cannot be loosened with the fingers alone. Also refer to the canopy manufacturers owners manual.

## TRIMMING CUTAWAY CABLES

Consult a rigger if you have **any** doubt about how to safely accomplish this procedure.

Because there are many various lengths of cable housings on many different rigs cutaway handles are manufactured to fit the longest housing. The cables must be trimmed to match the housings of the particular rig on which the handle is to be installed.

**Do not hook up the risers during this procedure.**

Feed the cutaway cables all the way through both housings and put the handle in its place on the harness. Make sure the long housing is not stretched out. Measure both cables sticking out of the housings (from the end of the housing) and mark each cable at 6½" (16.5 cm) within +/- ½" (1.75 cm) so that both risers leave at the same time during a cutaway.

Cut each cable at mark and finish the end by exposing it to heat (i.e. a lighter flame) for a few seconds so the nylon gets soft and easy to mould but **do not burn the nylon. Be careful not to burn your fingers from the hot nylon** (use leather glove if you are not sure you will handle it with bare fingers) and form the softened plastic coating to a blunt point over the cut. The finished point should completely cover the inner steel cable so that no sharp edges are exposed.

## ATTACHING THE TOGGLES

**Warning:** Incorrect toggle attachment to the steering line might result in the toggle detachment and sudden loss of steering control. If you are not familiar with this process do not attempt to attach the toggles by yourself and ask a rigger for help.

Follow canopy owners manual to determine the right steering line length. If you are not familiar with this process do not attempt to determine the length by yourself and ask a rigger for help. Failure to set the correct length of steering lines will cause difficulties and problems during flight and landing (i.e. you might be unable to achieve flare on landing or full speed during flight).

Ensure the steering lines are fingertrapped and routed correctly. The steering line must go straight from the tail through the slider grommet to guide ring on the riser. Make sure the steering line is not wrapped around any suspension line or any part of the riser.

Route the steering line straight through the guide ring on the riser



Thread the end of the steering line from bottom through the steering toggle grommet



Thread the bottom of the steering toggle through the loop on the end of the steering line.



Slide the loop on the top of the grommet and pull the steering line tight.



Check the canopy with the deployment brakes stowed and with the brakes unstowed to be sure that it is correctly configured and check the both steering lines have the same length.



## ATTACHING THE RISERS - CORRECT 3 RING CONFIGURATION:



- 1) The rings overlap each other and maintain metal-to-metal contact.
- 2) The rings are aligned in parallel planes.
- 3) The smallest ring is not pulled snug against the grommet; the white loop is long enough to give it some play.
- 4) The white locking loop goes straight down through the centre of the riser grommet on its way to the cable housing end fitting; it does not extend past the edge of the grommet hole and then turn back upwards towards the hole.

## ATTACHING THE PILOT CHUTE

Run the end of the bridle opposite the pilot chute through the grommet in the top of the main deployment bag. The bridle should be inserted from the outside to the inside of the bag (fig. 1). Secure the bridle with rapid link (fig. 2). Make sure the rapid link bolt is placed in a Kevlar cover and running through both loops on the bridle (fig. 3).



Then attach it to the ring/loop on the top of the main canopy. Be sure that the bridle stop-block on the bridle is between the bag and the pilot chute (fig. 1) on the outside of the bag.

## SETTING THE BRAKES

	<p>Set the deployment brakes on each side by pulling the control line down through the guide ring until the brake loop just passes through the guide ring and insert the stiffened upper portion of the toggle through the loop</p>
	<p>Insert the upper and bottom portion into their elastic keepers and pull the control line back up tightly against the guide ring.</p>



Next insert the stiffened lower portion of the toggle into the elastic keeper in the same direction as the top portion (from the bottom of the riser towards the top).

At this point, refer to the directions by the canopy manufacturer for flaking and folding the canopy.

**“Cock the Kill Line Pilot Chute”, before placing the canopy in the main bag!**

**PILOT CHUTE KILL-LINE INSTRUCTIONS:**

The pilot chute should be “cocked” before placing the canopy into the deployment bag. To do this simply anchor the bag (your foot works great) and pull out on the pilot chute handle until the centre line is tight. To double check that you have fully cocked the pilot chute, check to see that the green/blue portion of the kill-line is visible in the window on the bridle.

Collapsed pilot chute  
**WRONG – Not Ready to Jump**



“Cocked” pilot chute  
**OK TO JUMP**



Check the window  
**OK TO JUMP**



Try to fill the corners and sides of the bag to distribute the bulk evenly and avoid forming a lump in the middle.

Mate the locking stows with the suspension lines to close the mouth of the bag. Centre locking stow must be stowed first. During this part of the packing procedure always make sure that the rubber bands used for the locking stows are

right size, strong and in good condition. The weight of the canopy inside the bag comes to bear on these locking stows when the canopy is lifted off the jumper's back during deployment and a broken locking stow at this point may result in an out-of-sequence deployment.



Pull the bridle out from the top of the bag until the metal ring/loop of the canopy is seated against the grommet of the bag. Be sure there is no canopy fabric between the ring/loop, bridle and the grommet.

### **LINES STOWING**

Now stow the remainder of the suspension lines across the top flap on the bag in the rubber bands at each end. Make line stows as per canopy manufacturers recommended size/length. Leave approx. 15" of lines unstowed between the bag and the connector links. Use your knees or feet to "walk" on the bag, squeezing air out and distributing the bulk until the packed canopy is uniformly distributed within the bag.



Pick the bag up by its sides and set it into the container on its line stows.



Lay the risers in the "trough" between the sides of the reserve container and the riser covers.

### RISER FLAPS CLOSING SEQUENCE

- A - Reserve risers
- B - Internal riser cover
- C - External riser cover
- D - Tuck tab pocket

Place main risers on top of reserve risers (A). Continue routing the main risers down along side the reserve container stacking the front risers on top of the rear risers.



Make sure the main risers are not twisted and close the internal riser cover (B) over the main risers.



Close external riser cover (C) over the risers and internal riser cover. Make sure the external cover is in its tuck tab pocket (D)



### CONTAINER CLOSING SEQUENCE

Don't wrap the lines and risers around reserve pack tray. Place the bag in the container with the line stows toward the bottom. This position is important; if the line stows are toward the top, it may be more difficult for the pilot chute to extract the bag.



Place the bag in the container with the line stows towards the backpad and pilot chute bridle on top. **DO NOT ROLL THE BAG!**



Close the container by numbers  
Bottom flap + top flap



Route the bridle as shown below with the closing pin facing up



Close right flap ...



... then left flap and secure closing loop with the closing pin



Fold the bridle under the right flap ...



... and close the pin cover up.



## PILOT CHUTE FOLDING AND STOWING

Place pilot chute on a flat surface with the handle down and spread to its full size.



Fold the top and bottom edge in half towards centre.



Fold the left and right edge in half towards centre and even with the handle.



"S"-fold the bridle in the centre



Fold the right side of the pilot chute over the bridle



Fold the top of the pilot chute fabric down



Roll the fabric tightly up and insert it into spandex pouch as shown below.



Slide pilot chute into spandex pocket including the handle. Pat the pocket flat with the hand from the closed end towards the mouth of the pocket until the handle is exposed.





Tuck the bridle under the flap and massage the pocket as needed to smooth out the pilot chute.



## **PRE-JUMP INSPECTION:**

1. All ripcord and 3-Ring housings for bends, damage or obstructions.
2. Reserve ripcord pins, cables, handles and pockets for proper seating, wear and/or damage.
3. Main deployment activation devices (BOC and pull-out) for wear and placement. Also check routing of bridles for twists, etc.
4. Main risers routed smoothly over shoulders and riser covers closed properly.
5. 3-Ring release mechanism assembled properly and excess cable stowed properly.
6. All harness webbing and hardware for wear or damage.
7. All flaps closed in proper sequence and tucked in.

## PERIODIC MAINTENANCE:

To ensure safety and improve the lifetime of your harness and container system, perform periodic inspections and maintenance of your gear regularly. Generally it is recommended to check your gear every 25 or 50 jumps – depending on conditions and the way you and your packers treat your gear.

**Immediate inspection is required if the gear has been subjected to some abuse such as being dragged across the runway, a water landing or exposure to a lot of dirt or sand! It is important to maintain the system even more frequently in humid- muddy or freezing conditions!**

Inspection should be performed at least once per month. The more you use your equipment, the more frequently you should inspect it. If you find any damage do not hesitate to fix it. If you have any doubts about the condition or level of wear do not hesitate to ask qualified rigger for advice.

### Cutaway System

- Check and clean cutaway cables. If you are applying silicon on your cutaway cables check and clean your cutaway cables each month. If you are jumping in desert or dusty area your risers will need extra attention.
- “Massage” the areas on risers where the rings sit to restore its flexibility and clean those areas with dry cloth.
- Check the white loop for damage. Do not use risers with damaged loop

### Reserve Container (**ALL REPAIRS MUST BE DONE BY CERTIFIED RIGGER**)

- Check fabric and container stitching.
- Ripcords with kinks in the cable or pin, frayed or worn closing loop should be replaced immediately.

### Harness

- Check the webbing and main lift stitching. Any damage to selvedge edges of harness webbing or broken or missing harness stitching must be replaced or repaired prior to next jump.
- Inspect Velcro and replace if worn.

### Main Container

- Check the container fabric, stitching, grommets and plastic stiffeners for damage. Ask a rigger for advice if any damage found.
- Inspect the main closing loop for any damage. Do not use damaged or worn closing loops.
- Check the closing loop length. Too tight closing loop can result in pilot chute in tow. Too loose closing loop can result in premature opening of main container.
- Check the pilot chute kill line length and condition. If the apex inside pilot chute can not be fully stretched because the length of the kill line doesn't allow more stretch or the kill line is damaged or visibly worn it must be replaced immediately.
- Check pilot chute stitching, mesh, fabric and bridle condition. If any damage found ask a rigger for advice.

## 3 RING CUTAWAY SYSTEM

### CORRECT 3 RING CONFIGURATION:



- 1) The rings overlap each other and maintain metal-to-metal contact.
- 2) The rings are aligned in parallel planes.
- 3) The smallest ring is not pulled snug against the grommet; the white loop is long enough to give it some play.
- 4) The white locking loop goes straight down through the centre of the riser grommet on its way to the cable housing end fitting; it does not extend past the edge of the grommet hole and then turn back upwards towards the hole.

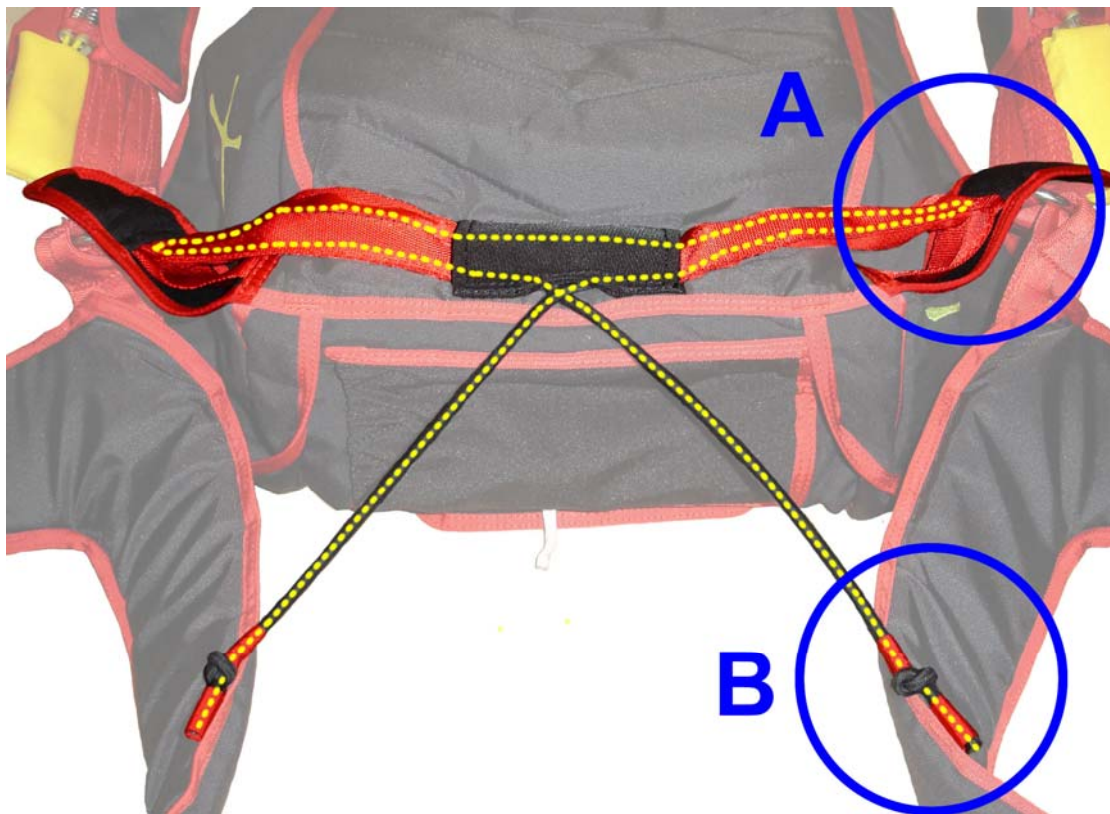
### 3 RING PRE-JUMP INSPECTION:

- 1) Each ring passes through only one other ring.
- 2) The white loop passes through only the small ring.
- 3) The white loop passes through the grommet on the end of the cable housing without twisting.
- 4) Nothing passes through the white loop except the yellow cutaway cable.
- 5) 3-Ring release handle is securely fastened to the harness, and no cable is visible between the handle and the cable housings. If your release handle has a tendency to hide itself, or flip under your main lift web, undo the Velcro and twist the handle in a clockwise rotation (when wearing rig) so the handle will stick out and slightly forward for a better grip.
- 6) We recommend that only MarS 3-Ring risers be used with the Real-X harness/container. If a Real-X is fitted with 3-Ring risers that were not built by MarS Inc, it is important that they be checked for proper configuration.

# REAL-X BUNGEE SYSTEM



Diagram of attaching and routing the bungee.



Detail **A**

Detail **B**





# RESERVE ASSEMBLING

## **WARNING:**

**Do NOT attempt reserve assembling and packing unless you have adequate RATING AND TRAINING!**

### **INTRODUCTION**

This section provides information needed to assemble the reserve canopy and attach it to the reserve risers. Take note that all Real-X rigs come MPAAD ready.



### **ATTACHING THE RESERVE CANOPY TO THE RESERVE RISERS**

Attach the canopy to the risers following the canopy manufacturer's instructions. Double-check the orientation of the canopy and the continuity of the lines. Check that the rapid links are tightened correctly and follow manufacturer's instructions on installation of slider stops if used. Check that the Slinks (Soft Links) are assembled correctly if used instead of rapid links.

### **ATTACHING THE RESERVE STEERING TOGGLES**

**It is important to follow the *reserve canopy owner's manual* directions before attaching the reserve steering toggles to the steering lines.**

The reserve canopy steering toggles are supplied with the Real-X. These steering toggles are compatible with the Real-X reserve risers. It is important to attach the steering toggles at the mark that is located along the steering line. The mark was measured and put there by the reserve canopy manufacturer. Proper alignment of the mark and the steering toggle will ensure the canopy will be in full glide while the toggles are resting against the guide ring after releasing the brakes.

# RESERVE PACKING INSTRUCTIONS

## INTRODUCTION

After the reserve parachute has been attached you may proceed with packing the reserve. This section provides instruction for packing the reserve parachute into the Real-X harness and container. Make sure to read through this section entirely before you begin packing the reserve canopy.

This manual does not contain specific instructions on canopy inspection, assembly or flaking. For these steps, the rigger must follow the instructions provided by the canopy manufacturer.

Regarding reserve canopy packing, follow the regulations and guidelines set forth by the sport parachuting governing body of the country in which you will be skydiving. For example, in New Zealand, a New Zealand Parachute Industry Association Parachute Technician certificate is required to pack any reserve parachute that will be carried for use in New Zealand.

## PARTS LIST

- 1) Real-X harness and container system with the Real-X reserve risers and reserve steering toggles
- 2) Ram-Air reserve canopy
- 3) Real-X free bag with bridle and running loop
- 4) Spring-loaded pilot chute PV - 038
- 5) Closing loop for reserve container
- 6) Real X reserve ripcord: Check with the manufacturer of your container for the correct length.

## COMMONLY USED TOOLS FOR RESERVE PACKING

- 1) Temporary pin with a flag
- 2) 2 Pull-up cords (1 thin, 1 thick)
- 3) Packing paddles
- 4) 2 Long velcro strips
- 5) Closing device (cranking tool)
- 6) Weight bags
- 7) Adjustable wrench

## PRIOR TO PACKING:

A complete check of canopy installation must be performed. It may be done on the ground following an order fixed by the rigger or/and by inflating the canopy during a sufficient time to check all elements.

Closely inspect every part of the canopy and Real- X harness and container system. Pay extra attention to following parts:

- 1) Deployment bag (free bag)
- 2) Pilot chute and bridle
- 3) Reserve Canopy
- 4) Reserve Lines
- 5) Connector Links

- 6) Reserve Risers
- 7) Harness and container
- 8) Closing loop
- 9) Reserve ripcord

**Prepare the reserve deployment free bag:**  
 Slip the round elastic loop into the webbing tunnel.  
 Route the elastic endings through the grommets:

## MOUNTING AN AAD

Follow the AAD manufacturer’s instructions for mounting the unit into container.



## RECOMMENDED CLOSING LOOPS LENGHTS

Maximum closing loop lengths		
Container Size	MPAAD (mm)	CYPRES (mm)
01	70	111
02	75	116
03	80	121
04	85	126
05	90	131
06	95	136



## SETTING BRAKES

Open the Velcro cover on the riser. Use the toggle to pull the steering line down until the brake loop just passes through the guide ring.



Insert the stiffened end of the toggle all the way into the loop. Pull on the steering line above the guide ring to seat the toggle against the ring.



Fold the excess line between the toggle and the loop into small (5-8 cm) folds and lay it neatly next to the toggle. Carefully close the Velcro cover to encase the stowed toggle and folded line.



Attach the toggle on the riser. Be sure none of the steering line is caught between the layers of Velcro.



## FLAKING AND FOLDING.

Follow the canopy manufacturer's instructions for flaking, folding, and dressing



## PLACING THE CANOPY IN THE FREEBAG.

Prepare canopy (fig. a) and carefully insert the ears the free bag, pushing each "ear" into the top corners of the bag, filling the corners evenly. Keep tapered shape (fig. b) and place main bulk of the canopy into the free bag leaving a inch or two outside.

Figure a

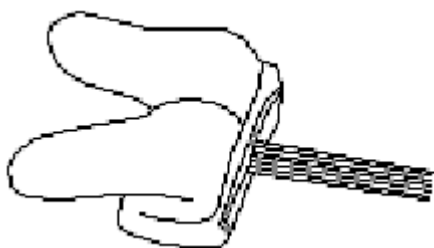


Figure b



Lock the bag closed with two loops of suspension line. Recommended loop length is approx. 1 ½ inch. A shock cord "running loop" must be used, do not use rubber bands.

Roll over the bag on your knee prior to stowing the lines into the bungee keepers.

**Do not twist or flip the freebag.**



## STOWING THE SUSPENSION LINES.

To stow the lines easy use the pullup to pull the lines through the bungee keepers.



Make the closing loop of desired size ...



... and pull it through. Loop should not exceed the keeper more than 1/2 inch.



Remove the Velcro strips if used and close the pouch. Be sure none of the lines are trapped between the Velcro pieces.



## PLACING THE FREEBAG IN THE CONTAINER.

Place the bagged canopy on the main container and position the reserve risers in the reserve pack tray. Spread the links to lower the bulk placing the rear links to the outside. Be sure to place the reserve risers far enough in the pack tray so they will lie flat over the shoulders. Pass the pull-up cord through the closing loop (fig. a).

Thread the pull-up through the grommet in the free-bag. Lay the bag in the container with the line-stow pouch on the under side and take extra care to fill up the lower corners of the container (fig. b).

fig. a



fig. b



## CLOSING THE CONTAINER.

Close the reserve in proper order. For easy identification the flaps are marked with numbers.

Thread the locking loop through the grommet of the first flap and lock it with temporary pin.

S-fold the first third of the bridle on the left side of the pin and the second third of the bridle on the right side of the pin. (as shown bellow)



Insert all the S-folds of first third of the bridle under the first flap



Do the same with the second third of the bridle.



Close second flap and secure it with temporary pin. The bridle should come out between first and second flap towards main canopy tray. Outside should be now 5-6 feet (150 – 180 cm) of bridle.



S-fold the length of free bridle on top of first flap.



Use T bar to thread the pull up through the pilot chute. Make sure the pull-up hasn't been pulled through the mesh part of the pilot chute.



Make sure the pilot chute base is centred over the loop, then compress it straight down and lock it with the temporary pin. If needed adjust the pilot chute position to balance the top of the pilot chute.



Compress the pilot chute. If any fabric or mesh is trapped between the coils pull it out. At this point check the length of the closing loop. If you can pull the closing loop more than  $\frac{3}{4}$  of inch above the top plate the loop is too long.

Lay the fabric flat around the pilot chute and check once more if the top of the pilot chute is balanced. If not, readjust the pilot chute position accordingly.



Fold the top and bottom of the pilot chute in large folds under the soft part of top cap.

Then do the same with the sides. **Make sure you did not trapped any part of fabric or mesh between or under the coils!**



Thread the pull-up cord through the reserve bottom flap 3. If the rig is equipped with Cypres/Vigil or similar AAD make sure to thread the closing loop through the cutter as well. Close and secure with the temporary pin.

Thread the pull-up cord through the flap 4 and secure with temporary pin.



Do the same with the flap 5 and lock it with temporary pin.



Check if the flaps are opening at the top. If yes it indicates there is too much material at the top and it needs to be redistributed to prevent the riser covers from popping.



Close the flap 6 and secure it with the ripcord pin. Test the pull force. The 22lb (9.9 kg) pull force should not be exceeded. Stow the reserve handle in its harness pouch.



Dress the container and seal the reserve. Close the reserve pin cover flap. Do not forget to fill out the reserve packing card inside the pin cover flap.



**! COUNT YOUR TOOLS !**

## Washing the harness and container

Regular care and cleaning of your Real-X will prolong its life and enhance the resale value should you decide to sell it. It is recommended that you have your rigger wash your Real-X at least once a year. The following techniques of washing MarS harness and containers have been utilized successfully for many years.

CAUTION! Some colours, such as red, may bleed and contaminate lighter colours like white. MarS Inc. therefore does not guarantee any results or accept any responsibility for colour changes resulting from following these washing instructions.

**Remove all canopies, AADs, and component parts such as toggles, RSL, rippers, bags, and elastic keepers as well as the packing data card.**

### *Hand Washing*

Materials required:

1. Wash tub
2. Medium stiffness brush
3. Mild liquid soap.
4. LOTS of fresh water.

**Step 1.** Soak rig in lukewarm water. Apply straight soap onto dirtiest areas and scrub with the brush. Soak in warm water for 20 minutes.

**Step 2.** Scrub the entire rig vigorously all over. Soak for another 20 minutes

**Step 3.** Repeat step 2. For particularly dirty rigs, you may want to empty the first batch of soapy water and wash in a fresh batch of soapy water.

**Step 4.** Squeeze out as much soapy water as possible. Immerse in fresh, clean, cool water and rinse several times until no further soap comes out.

**Step 5.** Hang to dry out of direct sunlight. Use of a fan directly onto the rig greatly speeds up the drying process.

### *Machine Washing*

Materials required:

1. Jumbo tumbler type commercial washing machine. It is not recommended to do this in your home washing machine.
2. Medium stiffness brush.
3. Mild liquid soap.
4. Large pillowcase or laundry bag.
5. Assortment of rags
6. Extra laundry.

**Step 1.** Wrap the hardware of the rig with the rags to pad them so they don't beat the inside of the washing machine.

**Step 2.** Soak the rig in lukewarm water and apply mild soap directly onto the dirtiest parts. Scrub these parts vigorously. Allow these parts to absorb the mild soap during the time you're travelling to the Laundromat.

**Step 3.** Place the rig into the pillowcase and add extra padding such as some of your regular laundry! Tie off the pillowcase to hold everything in. Place into the washing machine and wash in warm water.

**Step 4.** Run through at least two rinse cycles or hand rinse several times until no further soap comes out.

**Step 5.** Hang to dry out of direct sunlight. Use of a fan directly onto the rig greatly speeds up the drying process.

### **Scotchgard**

The use of Scotchgard brand fabric protector has become commonplace in recent years. This fabric treatment seals the pores of the fabric against dirt and other



stains. Scotchgard is not a magical "silver bullet" against dirt. However it has shown good results in keeping lighter colour fabric cleaner longer under normal use. Grinding in on grass or asphalt or other heavy abuse will still stain and/or damage the rig materials. Scotchgard is not harmful to today's container fabrics such as Para-pak and Cordura . There are currently several Scotchgard formulas. The standard fabric and upholstery formula in the RED CAN has proven the most successful. Do not use the rug and carpet formula in the blue can. After the rig is completely dry, hang it in a well ventilated location. FOLLOWING THE DIRECTIONS ON THE CAN, apply the protector to the entire OUTER SURFACE of the rig. For those areas such as the inside of the leg pads, backpad, and bottom of the main container, and light coloured panels such as white, etc, apply a second coat after the first has dried. **Do not spray the hardware, housings, and clear vinyl MPAAD window.** After the rig has dried, it may then be re-assembled and placed back into service.

## REAL-X SIZE CHART.

Container Size	Reserve packing volume cm <sup>3</sup> / cu.in	Main packing volume cm <sup>3</sup> / cu.in
<b>02</b>	<b>2679 / 163</b>	<b>3017 / 184</b>
<b>03</b>	<b>3389 / 207</b>	<b>3631 / 221</b>
<b>04</b>	<b>3556 / 217</b>	<b>3737 / 228</b>
<b>05</b>	<b>3809 / 232</b>	<b>4846 / 295</b>
<b>06</b>	<b>4304 / 262</b>	<b>6348 / 387</b>

## REAL-X COMPONENT CHART.

<b>RESERVE PILOTCHUTE</b>		
01661	PV-038	Reserve pilotchute
<b>FREBAGS</b>		
02169	VV-075/02	REAL-X freebag size 02
02235	VV-075/03	REAL-X freebag size 03
02236	VV-075/04	REAL-X freebag size 04
02007	VV-075/05	REAL-X freebag size 05
02294	VV-075/06	REAL-X freebag size 06
02388	VV-075/07	REAL-X freebag size 07
02379	VV-075/08	REAL-X freebag size 08
02380	VV-075/09	REAL-X freebag size 09
<b>RESERVE PARACHUTES</b>		
01066	V-102	Reserve parachute WP 110
00995	V-101	Reserve parachute WP 130
00994	V-094	Reserve parachute WP 150
01044	V-103	Reserve parachute WP 175
01068	V-104	Reserve parachute WP 210
01067	V-105	Reserve parachute WP 260
<b>PILOTCHUTES</b>		
01342	PV-042	Pilot chute PV - 042 (kill line,diameter 700mm)
01341	PV-043	Pilot chute PV - 043 (kill line,diameter 800 mm)
01339	PV-046	Pilot chute PV - 046 (kill line,diameter 900 mm)
02244	PV-052	Pilot chute PV-052(kill line,diameter700mm,freefly handle (soft pud))
02245	PV-053	Pilot chute PV-053(kill line,diameter800mm,freefly handle (soft pud))
01858	KM-01	Hackey handle mod for pilot chute
02159	NL PV-KL	Replacement pilotchute bridle with pin and kill line

<b>RISERS</b>		
01820	VK- 33/430/17-Z	Risers -33/430/17-Z housing
01813	VK- 33/510/20-Z	Risers -33/510/20-Z housing
02206	VK- 33/560/22-Z	Risers -33/560/22-Z housing
02400	VK- 33/430/17-Jh	Risers -33/430/17-Jh housing, slider holders
02401	VK- 33/510/20-Jh	Risers -33/510/20-Jh housing, slider holders
01821	HAUSING	Replacement housing (130 mm)
<b>SOFTLINKS</b>		
02192	SFL 135	Soft links MarS, lenght 135 mm
02193	SFL 145	Soft links MarS, lenght 145 mm
<b>REPLACEMENT TOGGLES</b>		
00971	RP-008	Replacement toggles for Z risers
02442	RP-008 Jh	Replacement toggles for Jh risers
<b>MAIN DEPLOYMENT BAGS</b>		
02170	VV-074/02	REAL-X deployment bag, size 02
02237	VV-074/03	REAL-X deployment bag, size 03
02238	VV-074/04	REAL-X deployment bag, size 04
02008	VV-074/05	REAL-X deployment bag, size 05
02293	VV-074/06	REAL-X deployment bag, size 06
02389	VV-074/07	REAL-X deployment bag, size 07
02377	VV-074/08	REAL-X deployment bag, size 08
02378	VV-074/09	REAL-X deployment bag, size 09
<b>EMERGENCY HANDLES</b>		
02314	U-079	Cutaway release
02464	U-081	Reserve ripcord

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