National Parachute Industries, Inc.
PO Box 245 - Palenville, NY 12463 - USA
PH 908-782-1646 FAX 908-782-5638 E-mail info@nationalparachute.com

Emergency Parachute Manual

NATIONAL 360 / NATIONAL 425 / NATIONAL 490 / NATIONAL FLAT

(TSO-C23b)

NATIONAL – "Your One Last Chance"

www.nationalparachute.com

(Manual P/N 81101-2P)

⚠ WARNING ⚠

Parachuting is a high risk activity which may cause or result in serious injury or death.

Parachutes sometimes malfunction, even when they are properly designed, manufactured, assembled, packed, maintained and used. The result of such malfunctions may be serious injury or death.

Do not purchase or use any parachute equipment manufactured or sold by National Parachute Industries, Inc. unless you understand and voluntarily accept these risks.

Do not purchase or use any parachute equipment manufactured or sold by National Parachute Industries, Inc. unless you agree to read, understand and follow all manufacturers' instructions, recommendations, requirements and limitations.

Do not purchase or use parachute equipment manufactured or sold by National Parachute Industries, Inc. unless you have read, understand and accept this "Warning" and the "No Warranty - Disclaimer - Waiver" which follows.

NO WARRANTY - DISCLAIMER - WAIVER

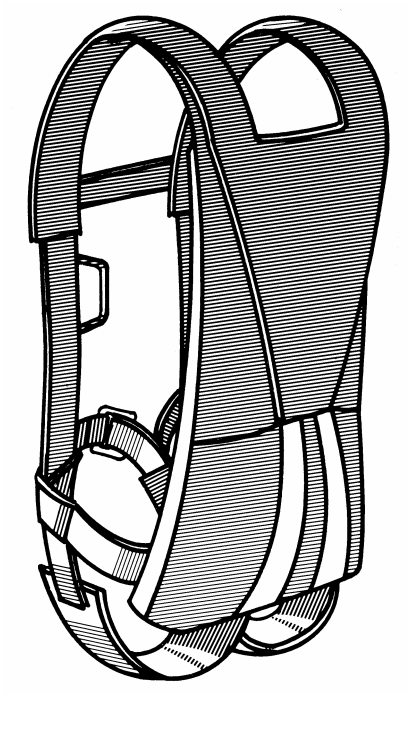
It is expressly understood and agreed that by the use hereof by the Buyer or any subsequent user that National Parachute Industries, Inc. and/or seller shall in no way be deemed or held liable or accountable and makes no warranty, either expressed or implied, statutory, by operation of law or otherwise, beyond that expressed herein. Parachute equipment is sold with all faults and without any warranty of merchantability or fitness for any particular purpose, expressed or implied.

National Parachute Industries, Inc. disclaims any liability in tort for damages, direct or consequential, including personal injuries, resulting from a malfunction or from a defect in design, manufacturing, materials or workmanship, whether caused by negligence on the part of National Parachute Industries, Inc. or otherwise.

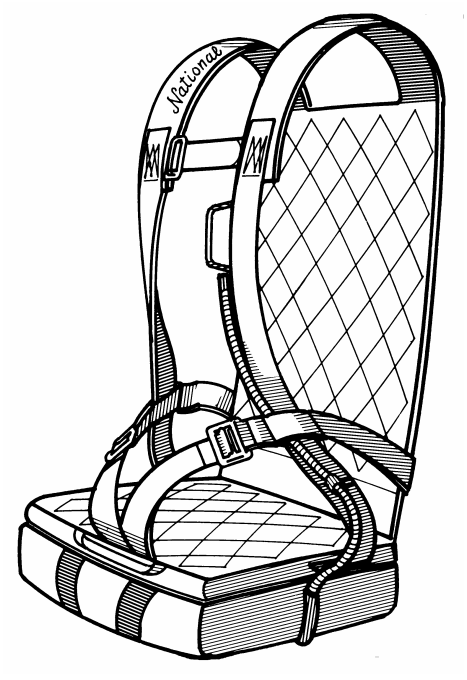
By using any parachute equipment manufactured or sold by National Parachute Industries, Inc., or allowing it to be used by others, buyer and/or user waives any liability, on the part of National Parachute Industries, Inc., for personal injuries or other damages arising from such use.

The liability of National Parachute Industries, Inc. is limited to the replacement of defective parts found under examination by manufacturer to be defective in material or workmanship within 120 days after purchase, and which has not been caused by an accident, striking, improper use, alteration, tampering, excessive use, misuse or abuse. The damages of the Buyer and/or user shall be deemed liquidated in the costs of replacement as above.

PARACHUTE ILLUSTRATIONS

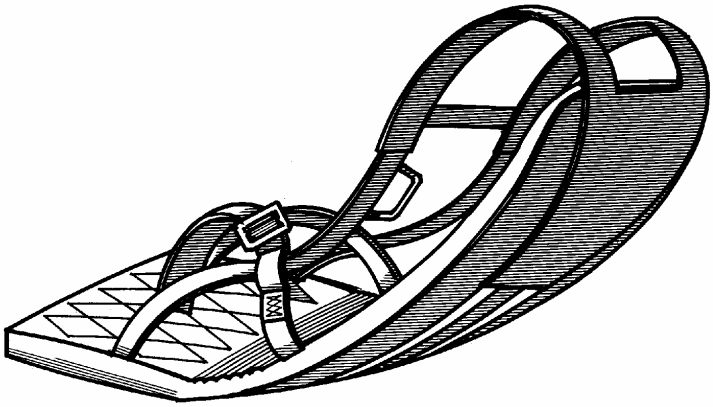


NATIONAL BACK PARACHUTE
(N-360 / N-425 / N-490)



NATIONAL SEAT PARACHUTE
(N-360-S / N-425-S / N-490-S)

"NATIONAL FLAT"



NATIONAL CHAIR PARACHUTE
(N-360-C / N-425-C / N-490-C)

PARACHUTE GENERAL INFORMATION

National Parachute is proud of its fine line of Pilot Emergency Parachutes. When you receive your new parachute system, please check the following:

➢Weight and airspeed limitations are listed on the orange warning label attached to the pocket under the "National" monogram on inboard side of right shoulder. Removal of this label voids all warranties and the TSO. Fold warning label into pocket when wearing parachute, otherwise display label.

➢For ease of access, the packing data card & TSO ID tag are located adjacent to warning label, inside the riser cover on right shoulder.

➢You may have received extra comfort pads with your parachute. They are provided for possible future use (i.e. convert from Thread-Thru hardware to snaps.

➢If parachute is purchased with the GRF (seat pad) option, the *"standard"* long leg pads are provided. Pads can be installed by the user if GRF is removed.

➢Laundering instructions for sheepskin option:

1) Rinse with cool water.
2) Wash in warm, soapy water for 3 minutes.
3) Rinse in warm water (twice).
4) Squeeze out excess water (do not twist) air dry, then brush.

➢Seat or Chair models require supplemental packing instructions.

CUSTOMER'S CHECK LIST

☐ Parachute Packing Data Card Present (under / inside right shoulder cover)

☐ Size / Model As Required

☐ WARNING LABEL Showing (tuck inside existing pocket)

☐ Owner's Manual Included

☐ Chair / Seat Packing Supplements Included (as applicable)

☐ Snap Comfort Pads Attached or Enclosed (see above explanation)

☐ Accessories Or Options As Ordered

☐ Save Box For Return Shipment (Repacks, Maintenance etc.)

AIR SPEEDS & PARACHUTES

In recent years, aerobatic aircraft have seen a vast increase in performance and speed. During various maneuvers it is common to exceed 200 knots.

Parachutes, on the other hand, have *not* kept up with this increase. The typical "modern emergency parachute" (of various makes) manufactured in the 80's and 90's is rated up to a **maximum deployment speed of 140-150 knots.**

BACKGROUND:
In 1981, National set out to design and successfully market a parachute to meet customer demands & requirements in the following areas:

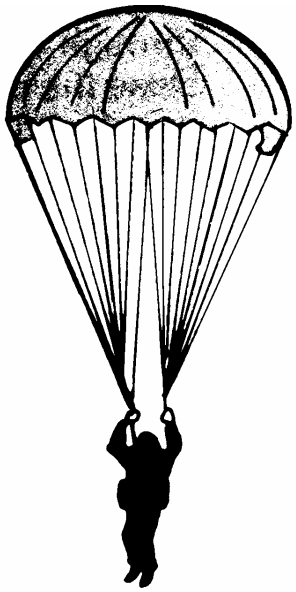
--Small volume

--Light weight

--Comfortable

--Competitive Price

--Meet TSO Requirements



With the above parameters in mind, we developed the *National* line of emergency parachutes. In 30+ years of manufacturing we produced over 15,500 emergency parachutes, earning numerous letters of appreciation for saved lives.

The question some pilots now ask is "what will happen if I bail out and open the parachute at 200+ knots? The answer is "we can not predict the results." Although testing requires a margin of safety, we have no way to determine the breaking point. Our parachutes are rated at and clearly display a placard indicating 140 knots is the maximum deployment speed.

Emergencies come in different varieties. In a "high air speed" situation (beyond 140-150 kts.) the aircraft may become "aerodynamically dirty" and slow down considerably on its own. If circumstances require an immediate high air speed bail out, we strongly advise the pilot to *delay pulling the ripcord* for 3-4 seconds after exit. In that short time the human body in free fall will decelerate rapidly to air speeds falling within design parameters.

From a development & manufacturing standpoint, time will determine if a broad demand exists for parachutes designed to withstand increased air speeds. Given current parachute materials and technology, this design would be heavier, bulkier and considerably more costly.

OPERATING LIMITATIONS

Recommended minimum deployment height: 500 ft AGL
Pilot weight range: 100 lb (45 kg) to 241 lb (109 kg)
Stability: +/- 5 degrees from vertical at gross weight
Normal altitude loss during opening: 200 - 300 ft.
Ripcord pull force: 22 pounds maximum
Forward drive: 3 - 10 mph (depending upon weight)
Steerability: 360 degrees in 8-10 seconds at gross weight
Normal opening time: 2-3 seconds (varies with airspeed)

To maintain performance level, the following relationships are recommended:

Up to 177 lbs. pilot weight.....National 360 with 24' Aerostar Canopy
Up to 208 lbs. pilot weight……National 425 with 26' Aerostar Canopy
Up to 220 lbs. pilot weight…National Flatpack with Preserve I Canopy
Up to 241 lbs. pilot weight……National 490 with 28' Aerostar Canopy

FITTING OF THE PARACHUTE

The National Parachute Harness has three primary hardware adjustments, one chest strap and two leg straps. There are three choices of hardware:

1. Thread-Through (T T)……..... →

2. Regular Snaps (B-12) / Adjustable V-Ring…... →

3. Quick Ejector Snaps (QE) / Adjustable V-Ring →

To don the harness with: 1) TT hardware is the simplest and lightest but typically requires the webbing be threaded / unthreaded from the hardware. This is mandatory for the chest strap, the leg straps may be operated the same way OR the webbing adjustment may be extended to the maximum (folded web ends hits TT) allowing to step in / out of leg straps. Cons…it can be cumbersome to operate. 2) B-12 snaps simply hook to the mating V-ring. To release the B-12 the guard is squeezed open to unhook from the V-ring. (Cons…some slack is required to unhook. 3) QE snaps hook on as the B-12 and have a built in lever to eject the V-ring which can be accomplished under moderate tension. It is easier and quicker to get out of the harness with QE snaps. (Cons…QE snaps cost more and may require added maintenance.)

FITTING OF THE PARACHUTE

(Continued)

Put the pack and harness on over the shoulders and fasten the chest strap. Pull the leg straps up between the legs and fasten both sides. Pull the free ends of the straps to remove excess slack and still maintain comfort. Skip ahead to the next page "Floating Harness Adjustment."

Your parachute harness also comes with adjustable leg pads. The pads can be easily moved back and forth over the leg strap webbing (below the junction of hip side strap and mail lift web (MLW). To position the pads for maximum comfort for an actual use, insert index finger between back of leg strap webbing and upper end of leg pad to un-mate the Velcro. Slide pad so the end is positioned near the leg strap hardware and re-mate Velcro. The pads will now be held in proper adjustment for the next wearing.

The final adjustments should be comfortable but snug and is determined by a compromise of the sitting and standing positions. Tuck leg strap ends into leg pad cushion and/or stow in keeper. Stow chest strap.

OPERATING INSTRUCTIONS

Prior to each flight you should check / inspect:

1) Ripcord handle secure in pocket, both pins properly seated in closing loops.
2) Ripcord housing for damage and end tacking secure.
3) All harness webbing and hardware for proper functioning and / or damage.
4) Packing data card to be sure that the parachute is “in date.”

The National Emergency Parachute is manually activated by pulling the ripcord. We recommend having the ripcord handle in sight or in hand when exiting the aircraft.

The ripcord handle is to be firmly gripped, typically with the right hand (the left hand or both hands may be used if necessary). After the handle is removed from the pocket, there is approximately 2” of slack in the ripcord cable to be removed before the pins are pulled. The ripcord is pulled to full arms length with a down-ward stroke for back and chair parachutes and an up-ward stroke for seat parachute. See drawings below.

BACK / CHAIR PARACHUTE

SEAT PARACHUTE

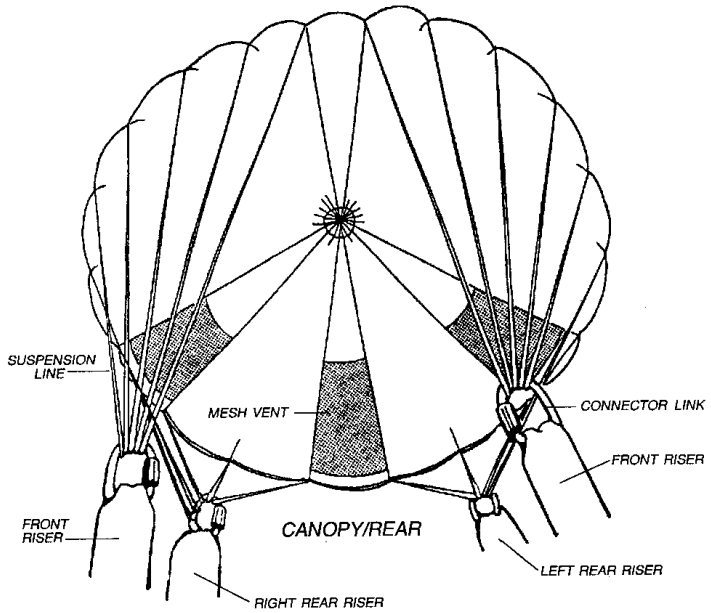
The parachute will normally open fully within 3 seconds of activation. If an emergency arises carry out the following steps:

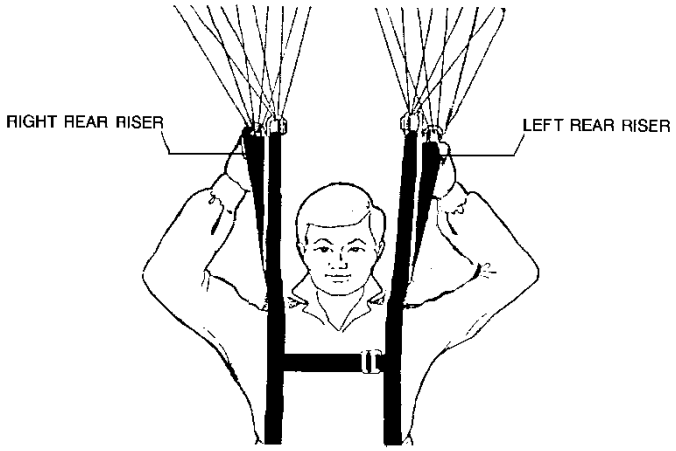
1) Check altitude above ground level.
   a) For bailout below 3,000 ft AGL, clear the aircraft and pull ripcord immediately.
   b) For bailout from 3,000-10,000 ft AGL, clear aircraft, delay ripcord pull for 5 seconds.
   c) For bailout above 10,000 ft AGL, delay to lower altitude before pulling ripcord.
2) Clear aircraft and pull ripcord.
3) Reach up and grasp the rear risers, pull one down to observe turn speed.
4) See next page “PARACHUTE STEERING.”

PARACHUTE STEERING

Once suspended under the parachute canopy, your rate of descent will stabilize at approximately 19 ft. per second with a 190 lb. (86 kg) body weight based on the National Phantom 26' (Part No. 81001-2) or the National Phantom AeroStar 26' (Part No. 81001-20) in your National 425 pack and harness assembly.

Your Parachute is circular in shape after it is fully open. There are three (3) mesh covered drive vents located at the rear of the canopy - see diagram below left. The drive vents make the canopy steerable and create an air speed of 5 mph to 12 mph (depending upon body weight and altitude) in the direction you are facing.





The Parachute can be turned to the right by pulling down the right rear riser 6" to 12", the same applies for a left turn. A rear riser can most effectively be pulled down by placing fingers between suspension lines as they attach to the connector link on the end of the riser. (See diagram above right.) The Parachute will continue turning until the rear riser is released. It takes about 8 - 10 seconds to complete a full 360 degree turn.

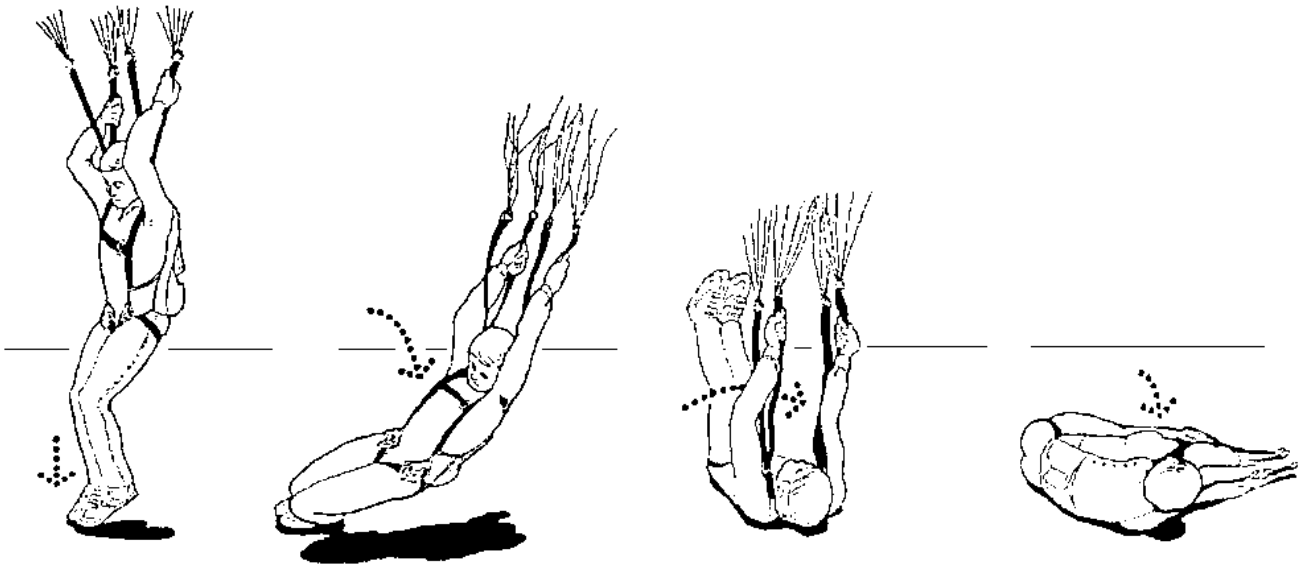
Observe wind speed and drift while looking for the best available landing area down wind of your present position. As a general rule, your glide angle is approximately 45 degrees to the horizontal in *light winds*. Choose a heading to achieve a track across the ground towards the landing area. At 100 feet above ground, turn into the wind and prepare for landing.

LANDING PROCEDURES

To minimize your ground speed at the point of landing, steer the parachute with either rear riser so that you are facing into the wind at 100 feet above ground level.

The normal procedures for assessing wind direction should be used. Flags are excellent wind direction and speed indicators as well as smoke, shadows or ripples on water/grass.

In preparation for landing, lock your legs together from thighs to ankles. Bend knees slightly forward and brace yourself as if you were to jump off a 6.5 ft (2 meters) high platform. Roll your body along your side to absorb landing shock. See picture series below:



HAZARD LANDINGS

WATER LANDING: Release the chest strap as you descend under the parachute, this allows for faster parachute egress after landing. Turn the parachute to face "into the wind" as normal, in case you are dragged by brisk winds it is better to be face up than face down.
Immediately after landing unhook both leg strap snaps (or fully extend the leg straps with TT hardware) and swim out of parachute harness to safety. Always swim up wind and up stream to avoid entanglement. After all the trapped air escapes from the parachute it becomes water logged and will sink!

POWER LINE LANDING: Make all attempts to steer clear of power lines, even if it forces a down wind landing. If unable to avoid power lines, place feet together, turn head to the side and try not to touch more than one line. If suspended above the ground, make sure power has been disconnected before a rescue attempt is made.

HAZARD LANDINGS

(Continued)

TREE LANDING: Make all attempts to steer clear of trees. If a tree landing is unavoidable, place feet and knees together, tuck elbows into stomach and protect your face with both hands while placing chin on chest.

HIGH WIND / DRAGGING: If winds are greater than 10 - 12 mph (10 kts), the Parachute may remain inflated after landing and drag you across the ground. Reach up and grasp one or more of the lower suspension lines of the Parachute and pull down hard, hand over hand, until the canopy is distorted enough to collapse. If you are being dragged uncontrollably across the ground by high winds, roll onto your back. The backpack will provide some protection from abrasion. When wind speed is reduced apply above procedure.

CARE / LIFE OF THE PARACHUTE

Parachutes are simultaneously very rugged and quite delicate. They are life saving pieces of equipment and should be treated with care. Parachutes are made of nylon, a very strong and durable material, but even nylon has enemies. Most acids will destroy nylon and ultra-violet light from the sun weakens nylon over time. This is a surface effect so the thicker materials (webbing or pack fabric) are not as seriously affected, but canopy cloth is very vulnerable. If your National Parachute is opened, avoid continued exposure to direct sunlight. Grease and oil may not damage the nylon but can stick the canopy fabric together, preventing it from functioning properly. Excessive moisture should be avoided; if the canopy becomes wet or damp, it should be aired to dry before repacking. For extended storage we recommend an environment with controlled humidity and temperature; unpack the parachute and place pilot chute and canopy loosely in a suitable bag, place the harness/container in a separate bag to keep Velcro hook away from the canopy fabric. To place parachute back in service, contact your local rigger or return to NATIONAL for inspection and repack.

When your National Parachute is in the aircraft, care must be exercised to insure that it is not damaged. Be sure that it does not come in contact with any sharp metal surfaces or other objects which might cut or snag it. All metal edges, exposed nuts and bolts, etc. should be taped or covered to prevent wear on the parachute container. Be sure that the parachute does not come in contact with water, oils, acids, grease or dirt. When in doubt consult your nearest parachute rigger, parachute loft or the manufacturer.

The formal determination of “Time / Life” or service life of a non-military personnel parachute is still open ended and non specific. Someone must take the initiative and make a judgment call to ground it. By comparison: “Personnel (military) parachutes have a determined service life (a maximum shelf life) without use of 16.5 years, and every personnel parachute is stamped with a manufacturing date that starts its life-cycle clock. A personnel parachute is also stamped with the date that it is first placed in service (PIS). From that point on, a parachute’s service life cannot exceed 12 years. The longer the unit sits on the shelf the less service life it has once placed in service.”

The Parachute Industry Association (PIA) has visited this issue without conclusion to date. Until the PIA specifies or recommends otherwise, it is the opinion of the current management at National Parachute that the maximum service life is 20 years from date of manufacture.