
UNIT 2 - EQUIPMENT CHECKS

RAM-AIR PARACHUTE
TRAINING MANUAL

BLM SMOKEJUMPERS

CHAPTER 2 - EQUIPMENT CHECKS

In this chapter, the student will be introduced to equipment checks and suit-up procedures. This unit is divided into three lessons: Equipment Check, Secondary Equipment Check, and Suit-Up.

CHAPTER OBJECTIVES

At the completion of this Chapter the student must:

1. Accurately perform an equipment check (buddy check). This will include identifying verbally and physically any irregularities in a fully suited up jumper and performing proper corrective actions to the equipment.
2. Accurately perform a secondary equipment check (pin check). This will include identifying verbally and physically any irregularities in a fully suited up jumper and performing proper corrective actions to the equipment.
3. Flawlessly suit up in their jump gear in no more than 2 minutes with all gear correctly in place.

EQUIPMENT NEEDS

1ea. - Mannequin dressed in jump gear with Ram-Air harness, main, reserve, and PG bag or fully suited jumper.

Lesson I EQUIPMENT CHECK

An instructor will demonstrate the proper procedures for checking the equipment of a fellow smokejumper fully suited up and ready to board the aircraft. Students will then perform the proper procedures and demonstrate competency with checks.

LESSON OBJECTIVES:

At the completion of this Lesson, the students must:

- **Demonstrate the steps taken in giving a fellow smokejumper an equipment check (buddy check).**
- **Identify irregularities in a fully suited up jumper and performing proper corrective actions to the equipment.**

EQUIPMENT NEEDS:

1 ea. - Have all students bring their jump gear to this lesson.

INSTRUCTOR NOTES

1. Students should be issued procedures for buddy checks and secondary equipment checks well before unit training, so they can familiarize themselves with the process ahead of time.
2. At the units, students look on while instructor runs through a complete buddy check of the mannequin, explaining what he is looking for and verbalizing the whole check. Following the buddy check the instructor should run through a secondary equipment check.
3. Students should be taught to talk their way through the checks, which helps instructors and fellow jumpers catch errors.
4. Students typically will do practice checks at the base of the tower before climbing the stairs for a tower jump. Students may do checks every other jump, or every time, depending on how quickly tower training is proceeding.
5. An instructor should be at the mannequin watching and listening to the student while he performs each buddy check, correcting errors and answering questions.

6. The first few checks should be of the dummy correctly suited--for later checks, the instructor can tamper with the mannequin's gear to provide something for the student to find.
7. Students should be exposed to several different kinds of gear problems during the training.
8. Buddy check training culminates in a test of the students--a student must complete at least one flawless inspection to pass unit training.

Equipment Check List

-Start at the bottom and work up, touching each item as you go. If you find a mistake, fix it, then return to the previous item and begin again. Begin by asking the jumper if he is ready for a check:

1. Jump pant stirrups under boot.
2. Zippers on jumpsuit pants down.
3. Leg pockets cinched with no excess cargo hanging out.
4. Harness leg straps over crotch protector, untwisted, and snapped, metal to metal.
5. All 3 P.G. bag straps clear and routed correctly.
6. Main container belly bands routed through belly band loops, attachment hardware snapped into reserve.
7. Good due date on reserve.
8. Reserve handle properly seated.
9. Curved reserve locking pins properly seated and sealed.
10. Lower RSL properly routed from locking pins to lower snap shackle and closed.
11. Upper RSL properly routed to upper snap shackle and closed.
12. Is your AAD off? (switch)
13. Have you done a self test? (AAD)
14. Reserve knife blade good? Snapped in place facing away from jumper.
15. Carabineer through harness droop risers, barrels fully closed with light pressure.
16. Chest strap properly routed through buckle and seated on velcro if equipped, otherwise chest strap is routed through elastic keeper.

17. Drogue release handle properly seated.
18. Main release handle properly seated.
19. Left and right 3-ring release assemblies properly attached to parachute risers; lightly pull cable housing to verify proper connection and routing. Verify assemblies are free from any debris and are not wet.
20. Drogue release 3-ring assembly properly attached to drogue bridle, large ring up. Verify assembly is free from any debris and is not wet.
21. Rubber band keeper is connected correctly to drogue bridle and drogue 3-ring assembly is in proper alignment.
22. Pull-the-dot snaps attaching main container to harness are connected and routed correctly.
23. Curved locking pin properly seated on main container.
24. Drogue bridle below pin extends to bottom of pin cover flap.
25. Static line in good condition and static line clip functional.
26. Static line weak link in good condition.
27. Give static line clip to jumper; ask if he or she has the following items: helmet, gloves, and letdown rope.

Lesson II SECONDARY EQUIPMENT CHECK

Students will demonstrate the proper procedures for performing a secondary check of the equipment of a fellow smokejumper fully suited up and ready to exit the aircraft.

LESSON OBJECTIVES:

- **At the completion of this Lesson, the students must flawlessly and in the proper order, demonstrate the steps taken in giving a fellow smokejumper a secondary equipment check (pin check).**
- **Identifying irregularities in a fully suited up jumper and performing proper corrective actions to the equipment.**

EQUIPMENT NEEDS:

1 ea. - Have all students bring their jump gear to this lesson.

INSTRUCTOR NOTES:

Background

The secondary check (pin check) was formally established following the Liston fatality. The foremost reason was to ensure that the PG bag attachment and strap routing was checked prior to exit. This had not commonly occurred during the equipment check as it was not typical for a jumper to be wearing the PG bag until immediately prior to exit. An additional reason was to standardize procedures between Alaska and Great Basin operations.

Prior to 2000, a secondary check of the 3-rings and main container pin was commonly performed on practice jumps in Alaska and the Great Basin. The secondary check was commonly performed prior to fire jumps in the Great Basin but not in Alaska.

This discrepancy in procedures likely developed due to differences in flight times to fires. Flight times to fires in the Great Basin are often shorter than in Alaska resulting in less time to perform equipment checks while on the aircraft. As a result, equipment checks are commonly performed prior to boarding the aircraft in Great Basin operations with a secondary check performed prior to the spotter briefing. Long flight times in Alaska resulted in the practice of suiting up fully and performing equipment checks 20 minutes prior to arrival at a fire. Because of the relatively short time between the equipment check and spotter briefing it was uncommon for jumpers to perform a secondary check during Alaska operations.

Secondary Equipment Check List

-Start at the bottom and work up, touching each item as you go. If you find a mistake, fix it, then return to the previous item and begin again.

1. P.G. bag straps routed correctly and hardware connected.
2. Main container belly band through belly band loops, attachment hardware snapped into reserve.
3. Left and right 3-ring release assemblies properly attached to parachute risers; lightly pull cable housing to verify proper connection and routing. Verify assemblies are free from any debris and are not wet.
4. Drogue release 3-ring assembly properly attached to drogue bridle, large ring up; verify assembly is free from any debris and is not wet.
5. Rubber band keeper of the harness is connected correctly to drogue bridle and drogue 3-ring assembly is in proper alignment.
6. Curved locking pin properly seated on main container.
7. Drogue bridle below pin extends to bottom of pin cover flap.

Instructor Notes:

Address the need for JPs to be aware of one another prior to getting in the door. Look each other over to make sure everyone is clean and ready. See that your JP has nothing hanging out of his leg pockets and top of pg bag is flat with no loose straps. In general, just be conscious of each other and look for anything out of the ordinary. Things can happen between the buddy checks, watching the streamers, hooking up, and getting in the door.

Equipment Check Items with Consequences of Failure

<p><u>Jump pant stirrups under boot</u></p>	<ul style="list-style-type: none"> • Crotch-strap of jump pants would be rendered ineffective, severe groin injury is likely to occur.
<p><u>Zippers on jumpsuit pants down</u></p>	<ul style="list-style-type: none"> • Potential for stirrups to become dislodged from boot soles rendering the crotch-strap of jump pants ineffective thus likely incurring a severe groin injury. • Increased potential to interfere with a clean exit.
<p><u>Leg pockets cinched with no excess cargo hanging out</u></p>	<ul style="list-style-type: none"> • Potential to interfere with clean exit greatly increases. A career ending injury resulted in the early 1980s when a leg pocket drawstring caught in the step upon exit. • Potential for horseshoe malfunction or other interference with parachute deployment occurs. A letdown rope fell out of a leg pocket during exit in the mid 1990s. The rope was in close proximity to the deploying main canopy.
<p><u>Harness leg straps over crotch protector, untwisted, and snapped, metal to metal</u></p>	<ul style="list-style-type: none"> • Routing of leg strap under crotch protector would likely result in severe groin injury. • Material interfering with snap and buckle could result in snap coming open prematurely. A leg strap became unsnapped during a fire jump in the mid-1990s. The jumper successfully completed the jump but handle placement and harness location were significantly altered.
<p><u>All 3 P.G. bag straps clear and routed correctly</u></p>	<ul style="list-style-type: none"> • Straps must be routed inboard of belly bands to prevent PG bag from riding up over the reserve. Incorrect strap routing in conjunction with a failure of lower attachment point could interfere with jumper performance of procedures, cause an inadvertent reserve opening, or interfere with a purposeful reserve opening.

Equipment Check Items with Consequences of Failure

<p><u>P.G. bag attachment hardware connected (Secondary Check)</u></p>	<ul style="list-style-type: none"> • An incorrect or lack of connection would increase potential for loss of PG bag and possibly interfere with the jumper's ability to execute procedures.
<p><u>Main container belly bands routed through soft loops on leg straps, attachment hardware snapped into reserve</u></p>	<ul style="list-style-type: none"> • Failure to route the main container belly bands through the soft loops could cause the main container to interfere with the operation of the drogue 3-ring by allowing the main container to shift upward. • Failure to snap belly bands to reserve would likely result in reserve interfering with jumper's ability to execute procedures, cause problems with reserve deployment, and/or cause main container to interfere with drogue 3-ring.
<p><u>Good due date on reserve</u></p>	<ul style="list-style-type: none"> • FAA regulations require that reserve parachutes be repacked by a licensed rigger every 120 days.
<p><u>Reserve handle properly seated.</u></p>	<ul style="list-style-type: none"> • Improper seating of reserve handle would increase potential for inadvertent reserve activation.
<p><u>Curved reserve locking pins properly seated and sealed</u></p>	<ul style="list-style-type: none"> • Improper seating of reserve locking pins would increase potential for inadvertent reserve activation. • FAA regulations require that reserve parachutes be sealed by the rigger.
<p><u>Lower RSL properly routed from locking pins to lower snap shackle and closed</u></p>	<ul style="list-style-type: none"> • Routing of lower RSL through reserve carabineer could possibly prevent a malfunctioning main canopy from being jettisoned which could interfere with deployment of reserve canopy. • Failure to close snap shackle would render RSL ineffective. Reserve opening altitude would be decreased due to necessity of manual activation.

Equipment Check Items with Consequences of Failure

<p><u>Upper RSL properly routed to upper snap shackle and closed</u></p>	<ul style="list-style-type: none"> • Routing of upper RSL over riser 3-ring could possibly prevent a malfunctioning main canopy from being jettisoned by interfering with the 3-ring mechanism. • Failure to close snap shackle would render RSL ineffective. Reserve opening altitude would be decreased due to necessity of manual activation.
<p><u>Did you do a self test? (AAD)</u></p>	<ul style="list-style-type: none"> • The AAD needs to be in the off position in order to properly arm when turned on at jump altitude. • Without a self test, the unit may not be working properly.
<p><u>Reserve knife blades good, snapped in place facing away from jumper</u></p>	<ul style="list-style-type: none"> • Blades may become worn due to flexing of knife in container. Severely worn blades do not cut effectively.
<p><u>Carabineers through harness droop risers, barrels fully closed with light pressure</u></p>	<ul style="list-style-type: none"> • Reserve performance would be degraded if only hooked up to one droop riser, performance would be irrelevant if not hooked up to either droop riser. • Over tightening of barrels can cause significant problems when taking off reserve. This could cause serious problems if a letdown was necessary.
<p><u>Chest strap properly routed through buckle and seated on velcro if equipped, otherwise chest strap is routed through elastic keeper</u></p>	<ul style="list-style-type: none"> • A chest strap improperly routed would render it ineffective thereby creating a situation where the jumper could fall out the harness upon opening shock. • Unseated velcro increases the potential for the chest strap to loosen and displace the drogue release handle increasing the likelihood of a “Lost Handle” malfunction.
<p><u>Drogue release handle properly seated</u></p>	<ul style="list-style-type: none"> • An improperly seated handle would greatly increase the potential for a “Lost Handle” malfunction.

Equipment Check Items with Consequences of Failure

<p><u>Main release handle properly seated</u></p>	<ul style="list-style-type: none"> • An improperly seated handle would greatly increase the potential for an inadvertent main cutaway. An inadvertent main cutaway occurred during a training jump in 2000 when the main release handle became unseated and released the main.
<p><u>Left and right 3-ring release assemblies properly attached to parachute risers; lightly pull cable housing to verify proper connection and routing. Verify assemblies are free from any debris and not wet.</u></p>	<ul style="list-style-type: none"> • Improperly connected 3-rings could result in riser failure and/or an inability to cut away a malfunctioning main. • Improperly routed cables could interfere with function of riser 3-rings resulting in an inability to cut away a malfunctioning main • Improperly routed cables could put excessive force on terminal end of cable during main deployment. A failure of the terminal end could result in a riser release and necessitate emergency procedures. • Pulling on the cable with excessive force could cause the terminal end to come off the cable. A failure of the terminal end could result in a riser release and necessitate emergency procedures. • Debris in the 3-ring assembly could result in riser failure and/or an inability to cut away a malfunctioning main. • It is possible for wet components of the 3-ring assembly to freeze which could retard or prevent a release of the mechanism.
<p><u>Drogue release 3-ring assembly properly attached to drogue bridle, large ring up. Verify assembly is free from any debris and is not wet.</u></p>	<ul style="list-style-type: none"> • Improperly connected 3-rings could result in assembly failure and/or an inability to release the drogue. • Debris in the 3-ring assembly could result in assembly failure and/or an inability to release the drogue. • It is possible for wet components of the 3-ring assembly to freeze which could retard or prevent a release of the mechanism.

Equipment Check Items with Consequences of Failure

<p><u>Rubber band keeper is connected correctly to drogue bridle and drogue 3-ring assembly is in proper alignment</u></p>	<ul style="list-style-type: none"> • An unconnected rubber band keeper allows the drogue 3-rings to come out of alignment. Proper alignment ensures consistent and immediate release of the 3-ring mechanism.
<p><u>Pull-the-dot snaps attaching main container to harness are connected and routed correctly</u></p>	<ul style="list-style-type: none"> • Unattached or misrouted pull-the-dot snaps would allow the main container to rise up and block the drogue 3-ring assembly increasing the potential for a “Drogue in Tow” malfunction.
<p><u>Curved locking pin properly seated on main container</u></p>	<ul style="list-style-type: none"> • An improperly seated pin could release the main d-bag from the container prematurely. Premature release of main d-bag could result in a horseshoe malfunction or other deployment problem.
<p><u>Drogue bridle below pin extends to bottom of pin cover flap</u></p>	<ul style="list-style-type: none"> • Potential would exist for drogue bridle to be pinched between the container and top closing flap causing a hesitation in the deployment of the main canopy.
<p><u>Static line and static line clip functional</u></p>	<ul style="list-style-type: none"> • A damaged static line could break upon exit and fail to deploy the drogue resulting in a high speed malfunction. • A nonfunctional static line clip could prevent a jumper from hooking up in the aircraft or prevent the spotter from removing the clip after exit
<p><u>Static line weak link in good condition</u></p>	<ul style="list-style-type: none"> • A damaged weak link could break upon exit and fail to deploy the drogue resulting in a high speed malfunction.

Equipment Check Items with Consequences of Failure

Give static line clip to jumper, confirm that jumper has helmet, gloves, PG bag and letdown rope

- Lack of equipment would preclude jumper from exiting aircraft.

Lesson III SUIT UP

Students will be taught techniques for suiting up in jump gear and tested on ability to perform procedure.

LESSON OBJECTIVE:

At the completion of this Lesson, the students must:

- 1. Flawlessly suit up in their jump suit, harness with main container or dummy main, reserve attached, helmet, and gloves on in no more than 2 minutes with all gear correctly in place.**

OR

- 2. Flawlessly suit up in their jump suit, harness, pg bag attached, helmet, and gloves on in no more than 2 minutes with all gear correctly in place.**

NOTE: Option 2 is the criteria if dummy mains are unavailable.

EQUIPMENT NEEDS:

Jump gear and dummy mains if available

INSTRUCTOR NOTES

Suit Up Demonstration

1. An instructor should demonstrate techniques for suiting up in jump gear.

The Suit-up Drill

2. Students are asked to suit up as quickly as possible without making any errors. They are then asked to take off their jump gear and get it "Jump Ready."
3. Tell the students they will need to demonstrate their ability to suit-up in no more than 2 minutes in order to pass the Units Training.
4. Test each student until they perform a flawless suit-up in less than 2 minutes. Check each student to assure they have made no errors and all their gear is correctly placed.