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Jettisoning System for a Parachute's Canister

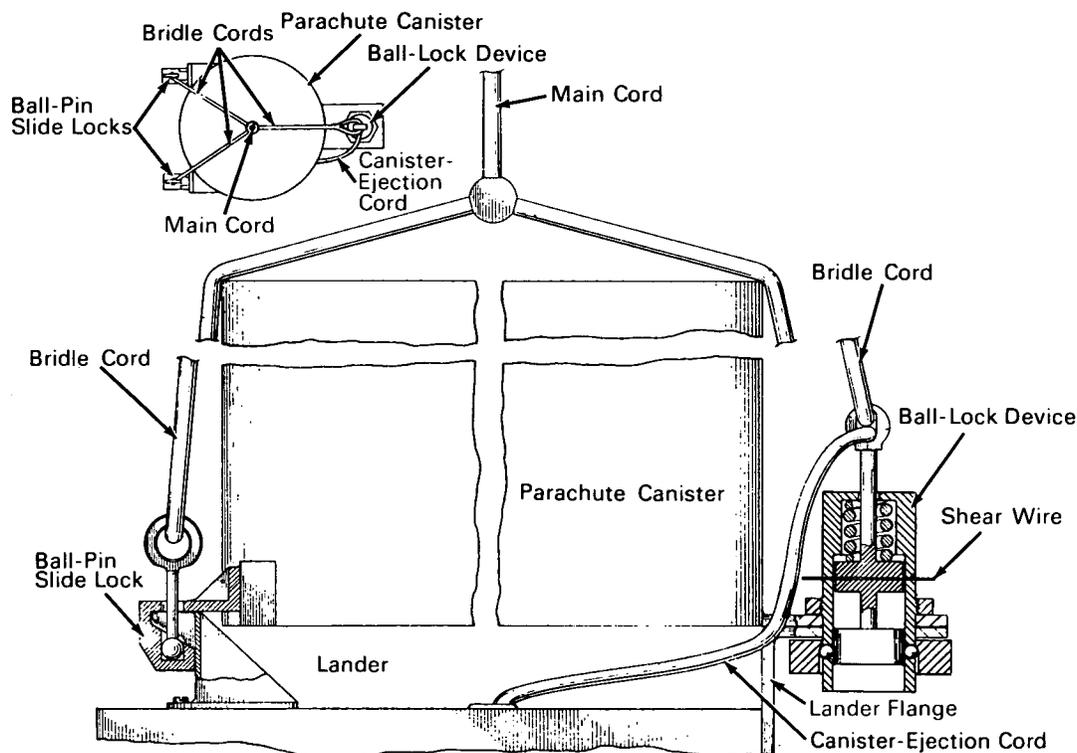


Figure 1. Canister-Ejection System between Launching and Opening of the Parachute

The problem:

Design of a system to jettison a parachute's canister (launched at supersonic speeds) between opening of the parachute and touchdown, so that the canister could not damage the lander on touchdown or subsequently interfere with its antenna. The system had to be independent of the lander's power system. The parachute had to release itself on touchdown, so that it would not drag or foul the lander.

The solution:

A three-point automatically released suspension and jettisoning system based primarily on a ball-lock device (BLD) operated by the shock of the parachute's opening and by the subsequent decay in the load on the main cord.

How it's done:

The parachute's main cord terminates in a three-cord bridle (Fig. 1); one bridle cord is attached to the

(continued overleaf)

BLD; each of the other two, to a ball-pin slide lock (BPSL). The BLD and the BPSL's join canister and lander, being peripherally spaced around the joint. One end of a relatively slack canister-ejection cord is affixed to the BLD; the other end, passed under the canister, is attached to the lander.

The shock on the main cord, of the parachute's opening, actuates the BLD; and, when the cord's load decays sufficiently, locking balls in the BLD are released. Thus its bridle cord can pull the BLD free, so that canister and lander are no longer joined at that point. At the same time, the canister-ejection cord, pulled taut, tips the canister sideways. Thus the two slide locks of the BPSL's are caused to part, freeing the ball pins so that the canister can be jettisoned.

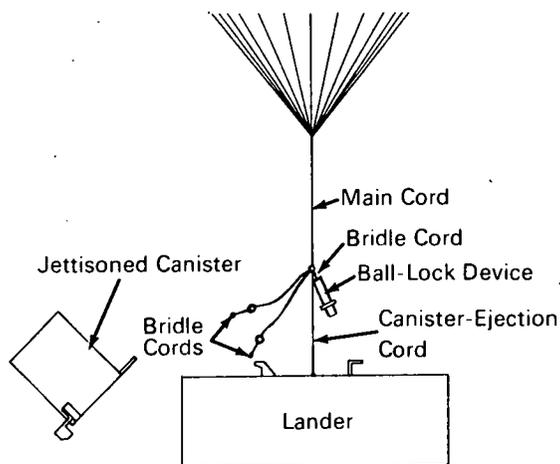


Figure 2. Final Mode of Descent

The lander continues its descent, now attached to the parachute by the canister-ejection cord in series with the parachute-to-BLD cord (Fig. 2). Upon impact the suspension cord is severed so that the lander is not dragged or fouled by the parachute.

Note:

Requests for further information may be directed to:
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Reference: TSP70-10398

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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