Ballistic Recovery Systems, Inc. 380 Airport Rd South Saint Paul MN 55075-3551 USA	www.BRSparachutes.com	Voice: 651-457-7491 FAX: 651-457-8651

PARACHUTE INSTALLATION MANUAL
BRS 1350 HS
FLIGHT DESIGN GmbH, CTLS

BRS Document Number:	020031-PM
Revision:	B
Date:	March 07, 2012

Abstract

These installation instructions were created in cooperation with Flight Design GmbH. This Parachute Installation Manual (PIM) complies with *ASTM F 2316, "Standard Specification for Airframe Emergency Parachutes for Light Sport Aircraft"*.

These instructions supplement the **"BRS Owner's Manual"** and the "**BRS General Installation Guide**". It provides additional direction relating specifically to the BRS-1350 HS parachute system installed in the Flight Design GmbH., CTLS Aircraft.

The signatures below verify that both BRS, Inc. and Flight Design GmbH certify and accept this manual, Document Number 020031-PM revision B, dated 03-07-2012 as the "Parachute Installation Manual" (PIM) for the CTLS AIRCRAFT, as required under ASTM Standard F2316.

Both parties agree that any deviations or changes to components affecting the functionality of the items listed in this Parachute Installation Manual will not be performed until the changes are reflected in a revised and accepted version of this document.

Signed: _____ JEFFREY E. PELTIER Date: MARCH 07, 2012

Title: MANAGER, PROGRAM ENGINEERING

BRS, INC.

Signed: _____ Date: March 08, 2012

Title: Technical Director; Head of Airworthiness

FLIGHT DESIGN, GmbH

Revision Page

Rev	ECO	Date	Author	Check	Approval	Description
A		02-14-2008	S. Zozula			Initial Release
B	1203-0001	03/07/12	J. Peltier			Update with changes

Flight Design GmbH, CTLS Aircraft

TABLE OF CONTENTS

BRS PARACHUTE INSTALLATION CHECK LIST 5

PARTS – 1350 HS CANISTER ASSEMBLY 6

HARNESS DIAGRAM OVER VIEW 7

HARNESS GEOMETRY IN DESCENT CONDITION 8

PART LIST- CTLS AIRCRAFT 1350 HS PARACHUTE 9

1. FRONT HARNESSES INSTALLATION 10

2. REAR HARNESSES INSTALLATION 11

3. ROCKET ASSEMBLY AND INSTALLATION 13

4. PARACHUTE CANISTER INSTALLATION 15

5. ACTIVATION HANDLE AND HOUSING INSTALLATION. 17

6. CONNECTING ACTIVATION CABLE TO THE ROCKET 18

7. PLACARD PLACEMENT 21

BRS PARACHUTE INSTALLATION CHECKLIST

Flight Design, CTLS Aircraft

This checklist must be completed and signed by installing mechanic or certified aircraft assembly technician. Detach and return signed copy to BRS Inc. along with required installation photos for registration and quality control purposes.

Note: If parachute assembly and rocket are installed in separate locations, the first installers should sign and make copy for themselves. Send the uncompleted Installation Checklist along to the final installers, who will make the final signatures, make a copy and send to BRS.

BRS Unit Serial Number:_____

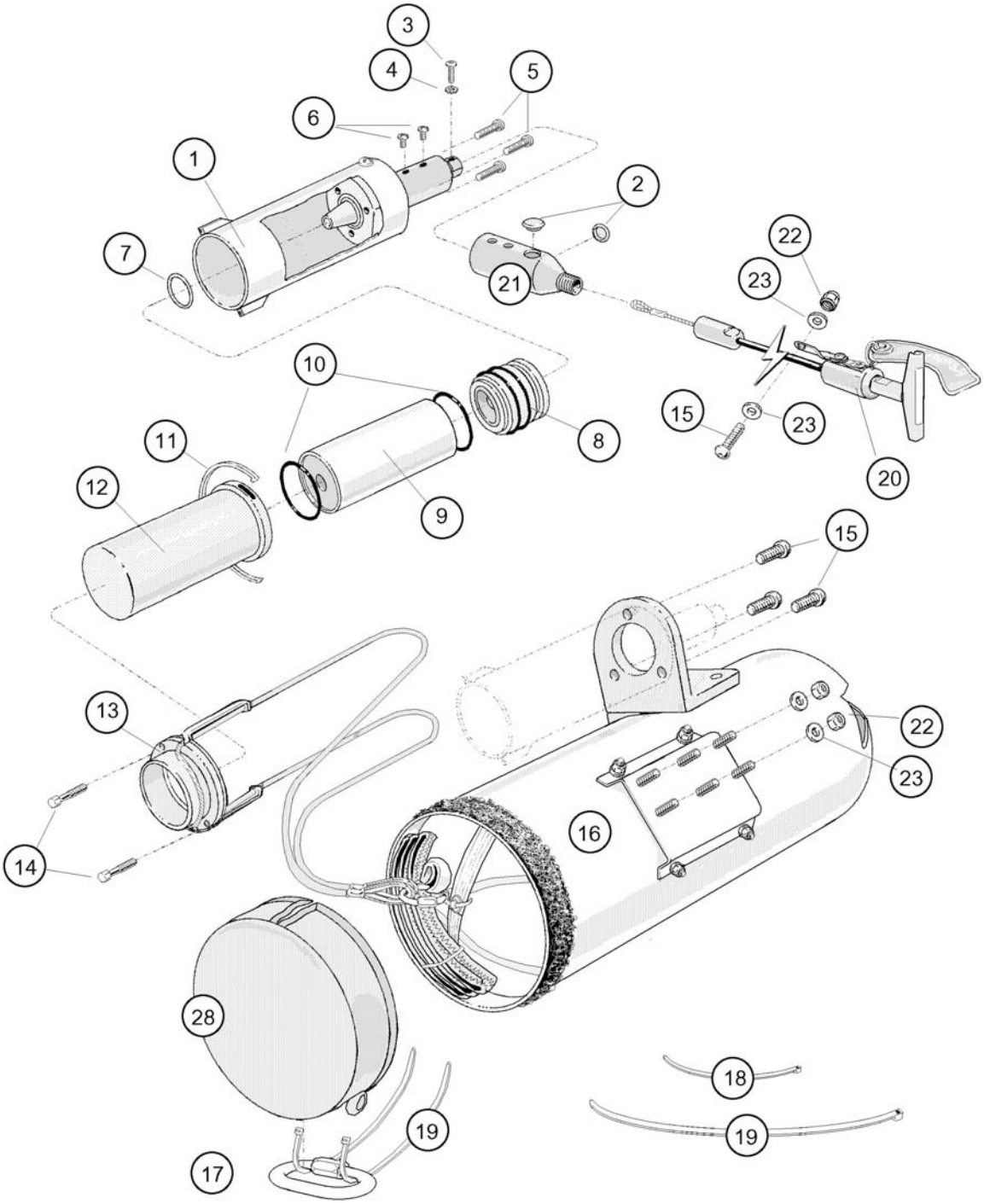
Aircraft N # :_____

Parachute install completed by:_____ Date:_____

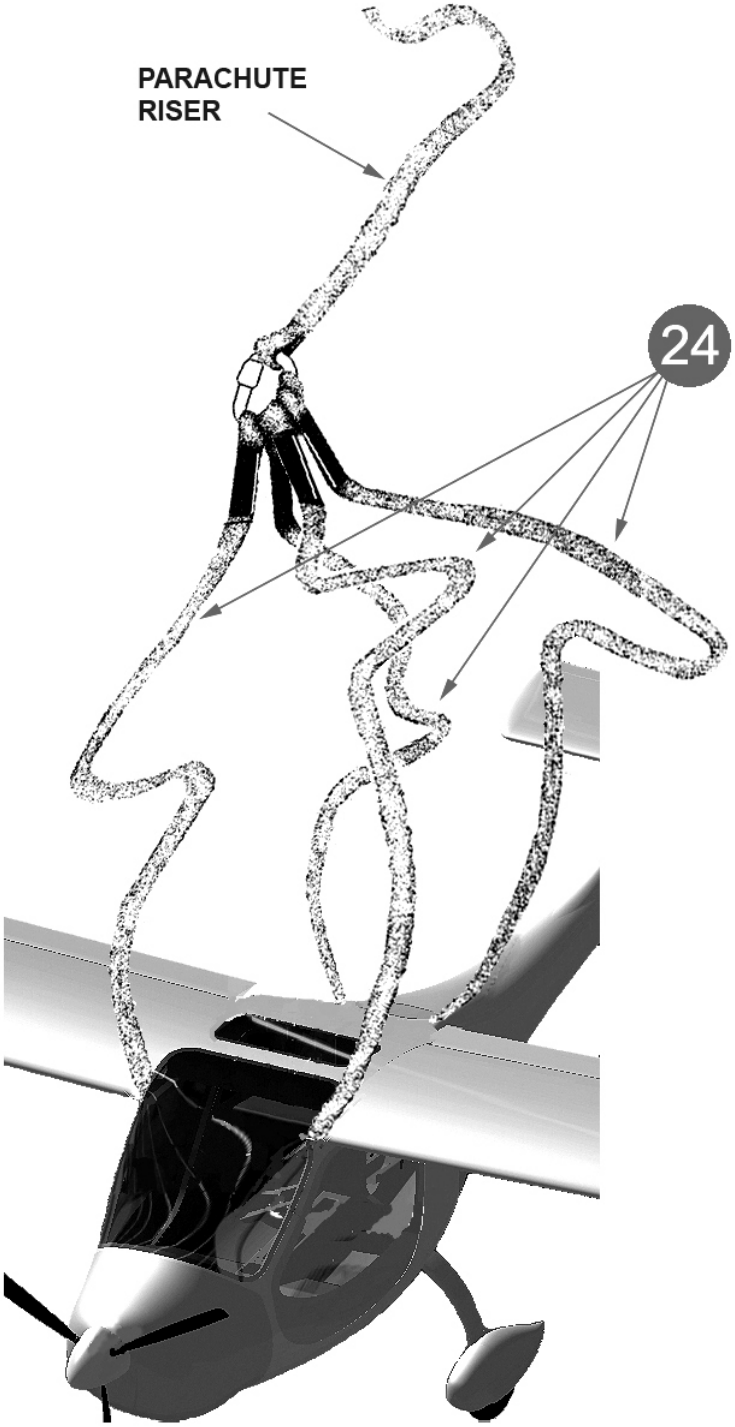
Rocket install completed by: _____ Date: _____

	TWO FRONT AND TWO REAR HARNESSES installed as per INSTALLATION MANUAL.
	ROCKET assembled as per Dwg. 020028-01 (Instructions shipped with rocket fuel box.)
	ROCKET installed into LAUNCH TUBE (item 1) secured with NYLON SCREWS (item 5)
	ROCKET connected to ROCKET MOUNT. LOCTITE on SCREWS (Item 15)
	Parachute unit installed and checked for security.
	All 4 KEVLAR HARNESSES attached to LINK (Item 17) on CANISTER. Gate closed.
	ACTIVATION HANDLE ASSEMBLY installed as per INSTALLATION MANUAL.
	ACTIVATION HANDLE HOUSING ASSEMBLY connected to ROCKET as per BRS Drwg. 610 –A.
	Ensure SAFETY PIN WITH FLAG installed into ACTIVATION ASSEMBLY.
	ACTIVATION HANDLE HOUSING ASSEMBLY mounted securely and routed with no tight bend radiuses along routing path.
	PLACARDS applied to aircraft as per INSTALLATION MANUAL.
	BRS OWNERS MANUAL AND GEN'L INSTALL GUIDE (020006-PM)delivered with aircraft to end customer.

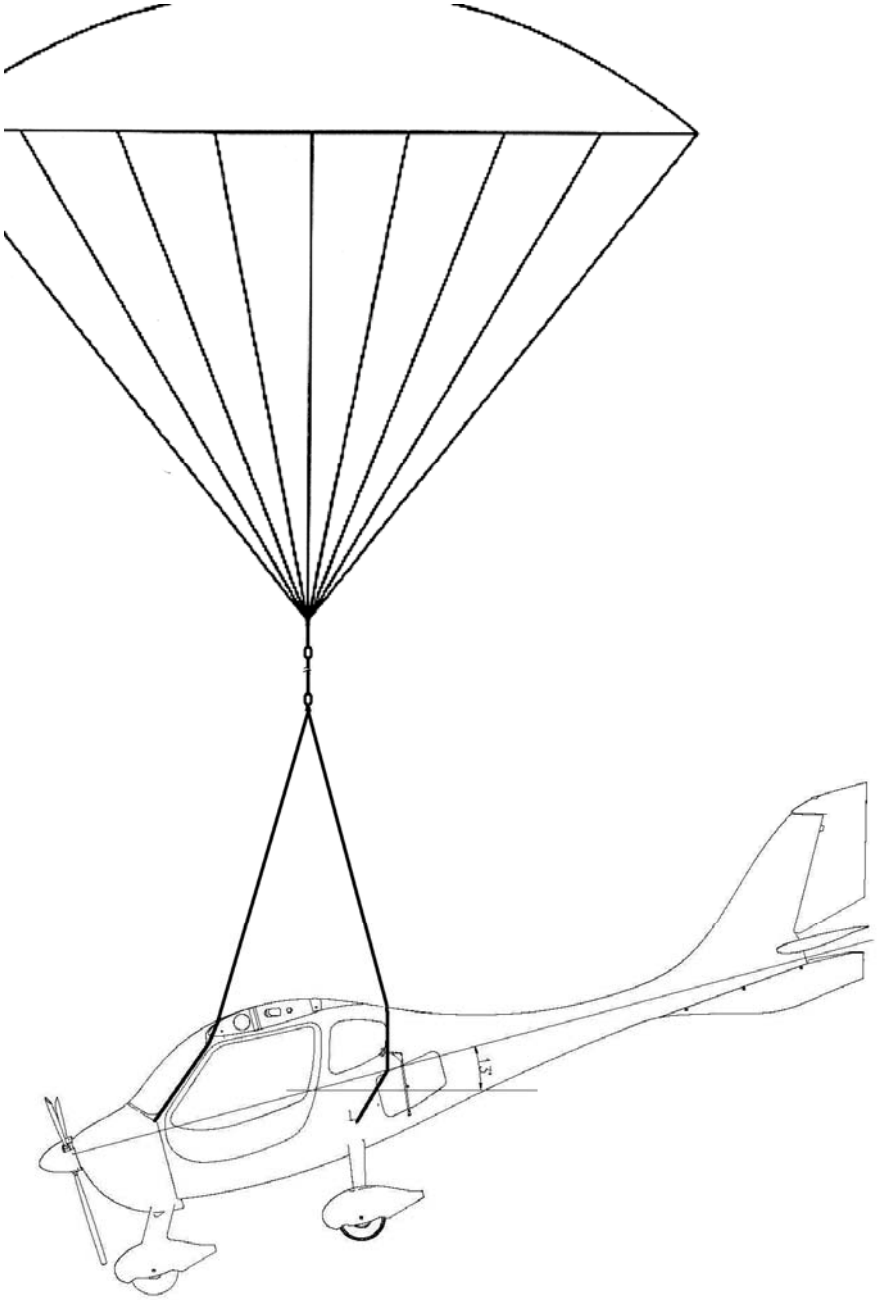
PARTS – 1350 HS CANISTER ASSEMBLY



HARNESS DIAGRAM OVER VIEW



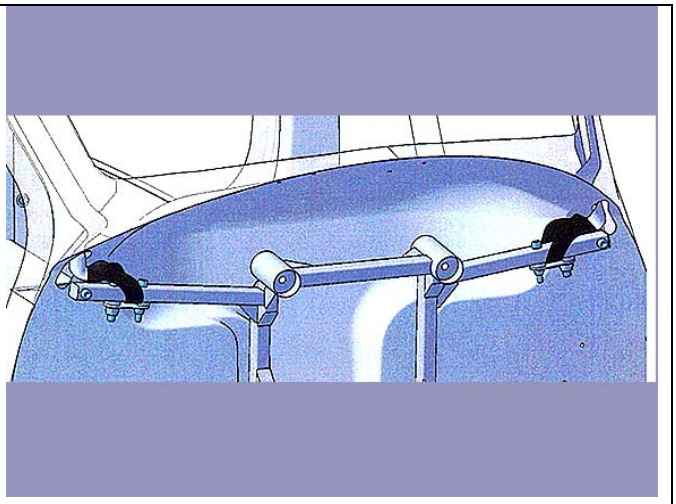
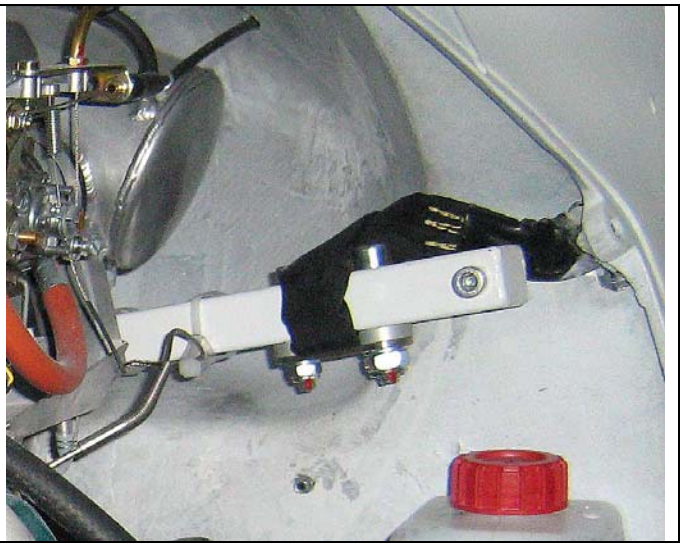
HARNESS GEOMETRY IN DESCENT CONDITION



PARTS LIST – CTLS AIRCRAFT 1350 HS PARACHUTE

ITEM	QTY.	PART NO.	DESCRIPTION
1	1	008409-01	ASSY. ROCKET BASE AND IGNITER, BRS 600
2	3	005033-01	PLUG, CAP, SMALL
3	1	004035-01	SCREW, 10-24 X 5/8
4	1	004055-01	WASHER, EXT. TOOTH, #10 S.S.
5	3	017100-01	SCREW, NYLON 10-32 X 3/4"
6	2	017004-01	SCREW, 10-24 X 3/8"
7	1	002586-01	O-RING, BASE
8	1	009210-01	ASSY., ROCKET AFT BULKHEAD, BRS 601
9	1	002268-01	KIT, ASSY. PROPELLANT BRS 601
10	1	014112-01	O-RING, SPACER (part of item 9, above)
11	1	014113-01	ORTMAN LOCK KEY
12	1	002102-01	CASE, MOTOR, BRS 600
13	1	014104-01	COLLAR ASSY, PICK-UP
14	2	017104-01	SCREW, 8-32 x ¾ SPECIAL
15	4	004042-01	SCREW ¼-20 X ¾"
16	1	008939-01	1350 HS CAN SHORT MOUNT
17	1	005061-01	LINK, QUICK ½" SS
18	4	004025-01	CABLE TIE, PLASTIC 4"
19	22	004000-01	CABLE TIE, PLASTIC, 10 ¾"
20	1	008040-05	30" ACTIVATION ASSY
21	1	005204-01	CONE, ROCKET
22	11	004001-01	NUT, NYLOCK ¼-20
23	20	004010-01	WASHER, ¼"
24	4	007395-17	KEVLAR FRONT AND REAR HARNESS (B157/132C)
25	1	006230-01	LABEL "STAY CLEAR, DANGER"
26	3	006231-01	LABEL "BALLISTIC WARNING"
27	1	006206-01	LABEL, BRS 6 LOGO
28	1	001350-02	COVER, BAG DEPLOYED, 8" CAN

1. FRONT HARNESSES INSTALLATION.

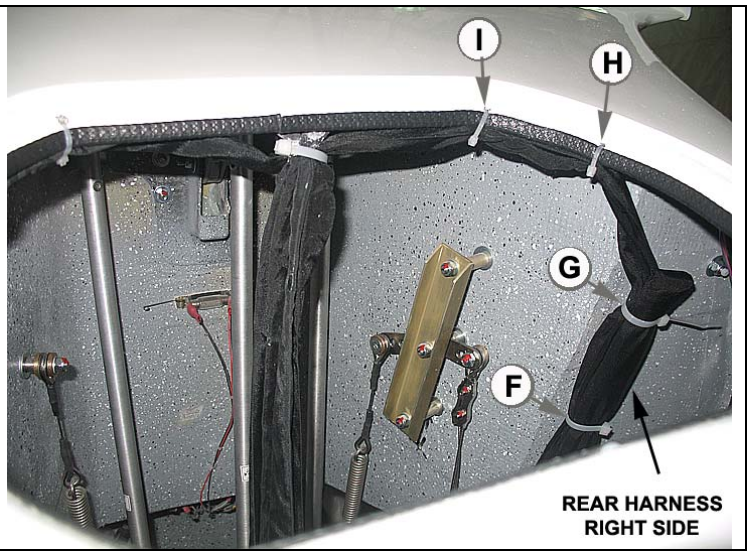
1.1	Verify correct installation of Kevlar® Front Harnesses (ITEM 24). There should be one harness looped around each side of the upper engine mount tube, using a “Lark’s Head” knot. They are routed up the door posts and across the cabin (just under the top skin) to the luggage/parachute compartment. These harnesses are supplied by BRS to the Flight Design factory for installation during production.	
1.2	Review correct installation of Front Harness on the left hand side of the aircraft.	
1.3	Review correct installation of Front Harness on the right hand side of the aircraft.	

2. REAR HARNESS INSTALLATION.

2.1	Connect Rear Harness (item 24) to factory installed bracket (name CLAMP) on the right hand side of the aircraft using a “Lark’s Head” knot. Pass free end through large loop – pull up tight. Secure Harness using Cable Tie (item 19) in position A.	
2.2	Secure Harness to aft bulkhead using Cable-Ties in locations shown.	
2.3	Secure Harness to overhead using Cable-Ties in locations shown.	

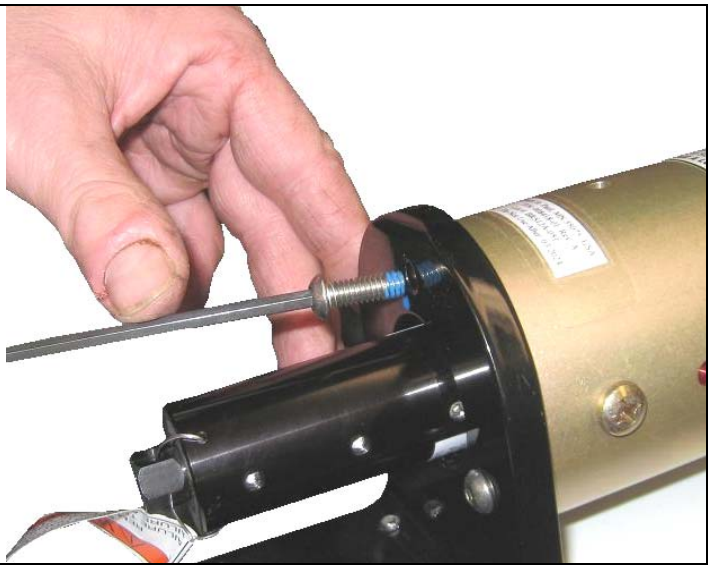
2.4	Attach Harness to pre-installed bracket in overhead near aft cockpit bulkhead. Use single Cable-tie in this location.	

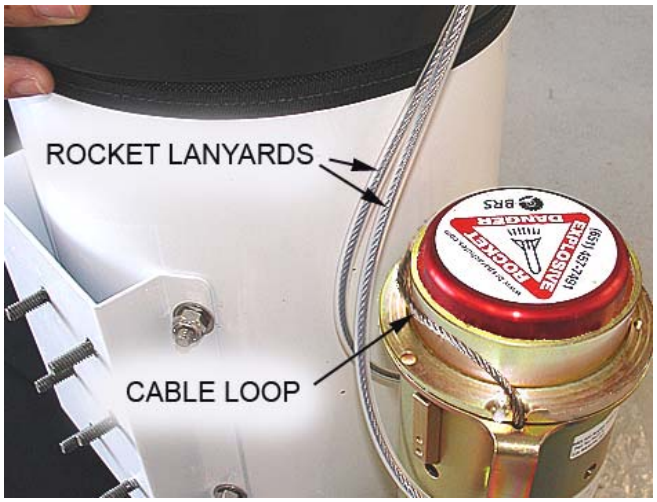
2.5	S-fold extra length of the Harness, apply two Cable-ties (item 19) and secure to pre-installed attachment brackets. Install Harness on left side in same manner as is the right side.	

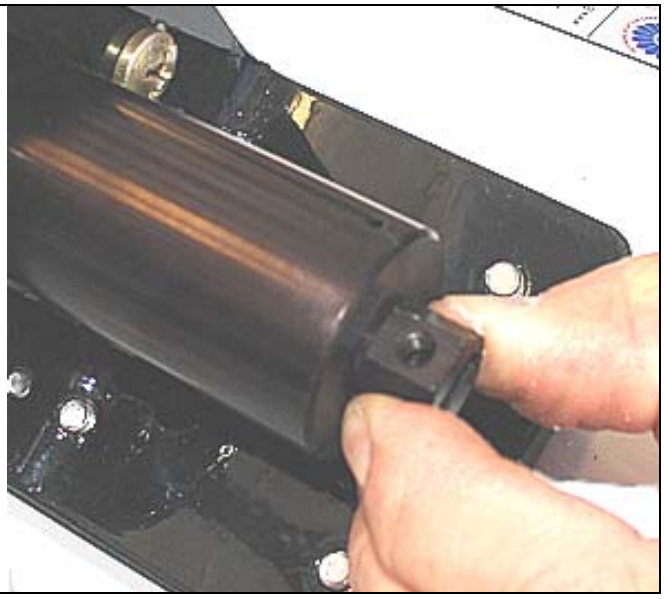
2.6	Secure S-folded Harnesses to flange on inside of egress hole by drilling small holes to accept Cable-ties in approx. locations shown. Do this for both sides. Gather Harnesses in middle and secure with Cable-tie, to keep them orderly.	

3. ROCKET ASSEMBLY AND INSTALLATION.

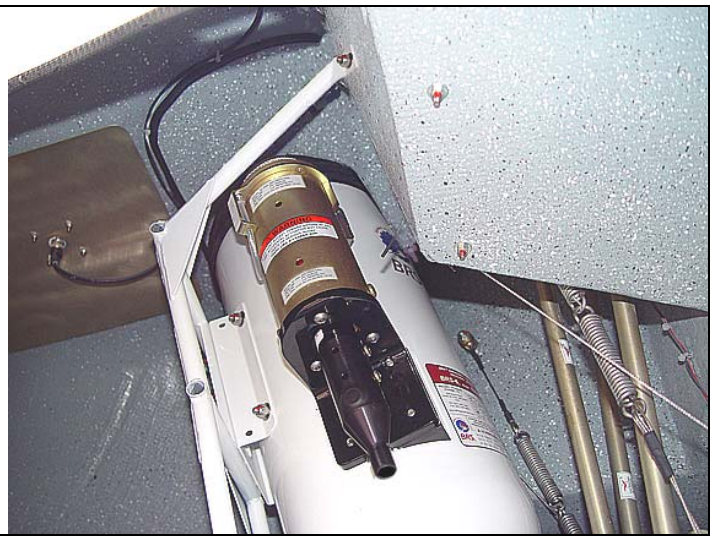
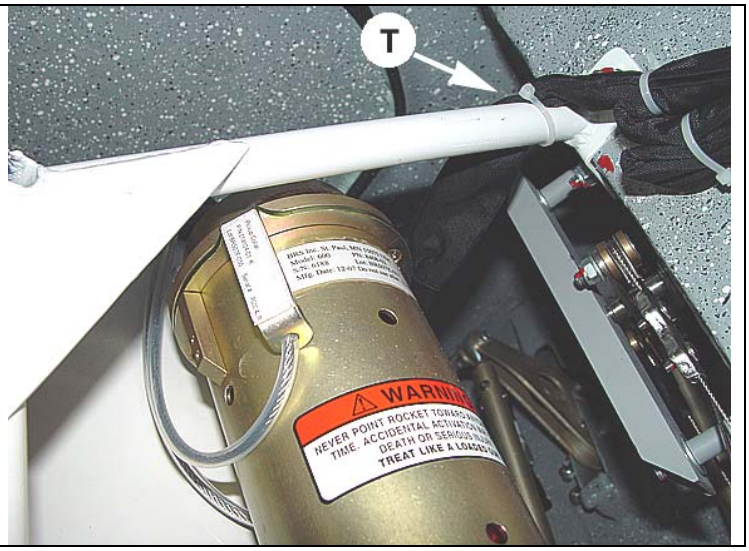
3.1	Assemble Rocket as per Rocket Assembly Instruction set. Attach Rocket to Canister prior to installing unit into airplane. Note the hole pattern on bottom of Rocket Launch Base. It's asymmetrical – it only fits on the Rocket Mount one way.	

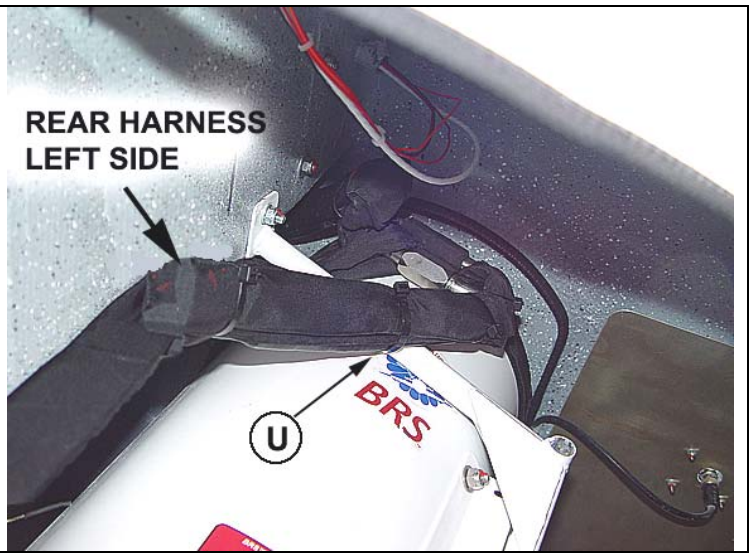
3.2	Attach Rocket to the Rocket Mount by passing Igniter Body through hole in Rocket Mount. Apply small drops of Loctite 242 to threads on ¼-20 Screws (item 15) and secure Rocket by screwing through Rocket Mount.	

3.3	Remove Aluminum Screws (item 14) installed at the top of the Launch Tube. Slide Pick-up Collar over Rocket and onto Launch Tube. **IMPORTANT: ENSURE THAT CABLE LOOP IS PLACED TO SIDE OF THE ROCKET – NOT OVER THE TOP.** **DANGER! CABLE ROUTED OVER TOP OF ROCKET WILL CAUSE DEPLOYMENT FAILURE, POSSIBLY RESULTING IN DEATH OR SERIOUS INJURY!**	

3.4	With Pick-up Collar positioned properly, secure Collar by replacing Aluminum Screws (item 14). **USE *242 LOCTITE* ON THESE SCREWS.** **DO NOT OVER TIGHTEN.** **ENSURE ROCKET LANYARDS ARE NOT ROUTED OVER TOP OF THE ROCKET.**	
3.5	Twist (do not pull) Actuator on bottom end of Rocket until larger, unthreaded hole is facing away from Canister.	
3.6	Install Rocket Cone with larger access hole also facing away from Canister, to facilitate installation of Handle Assembly later. Apply ***242 LOCTITE*** to thread of two Screws (item 6) and secure.	

4. PARACHUTE CANISTER INSTALLATION

4.1	Install BRS Canister unit to aircraft parachute frame. Check alignment of Canister and Rocket with egress hole and ensure outer edge of Rocket Pick-up Collar is clear of upper frame tube. Use washers between mounting bracket to shim parachute for better alignment, if necessary.	
4.2	Use 6 Nylon Lock Nuts (unit 22) and 6 Washers (unit 23) to secure unit to frame.	
4.3	Attach Rear Harness to upper frame tube on the right hand side using one Cable Tie (item 19) in position T. Make sure that Harness is routed over top of upper horizontal frame tube.	

4.4	Attach Rear Harness to upper frame tube on the left hand side of the aircraft using one Cable Tie (item 19) in position U. Make sure that all Harness material is routed to the outside of all structural frame tubes to ensure clear egress of Harnesses. .	

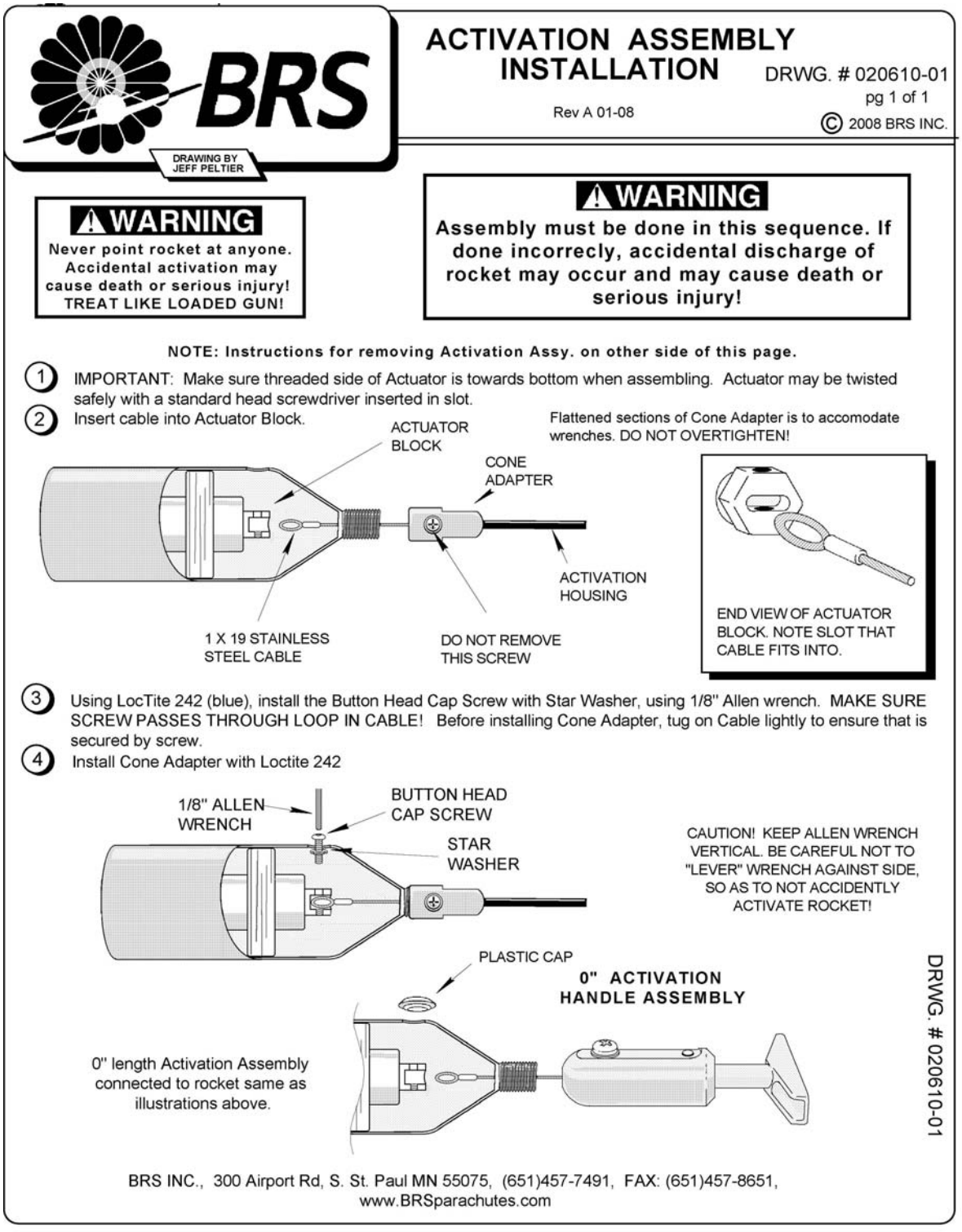
4.5	Connect all four Harnesses to #12 Quick-link. (item 17) attached to Canister Cover. Apply Loctite 242 to Link threads and close the gate until snug. **Do Not Over Tighten**. **WARNING: Ensure that no Harnesses pass over top of Canister, Rocket or Rocket Lanyards!**	

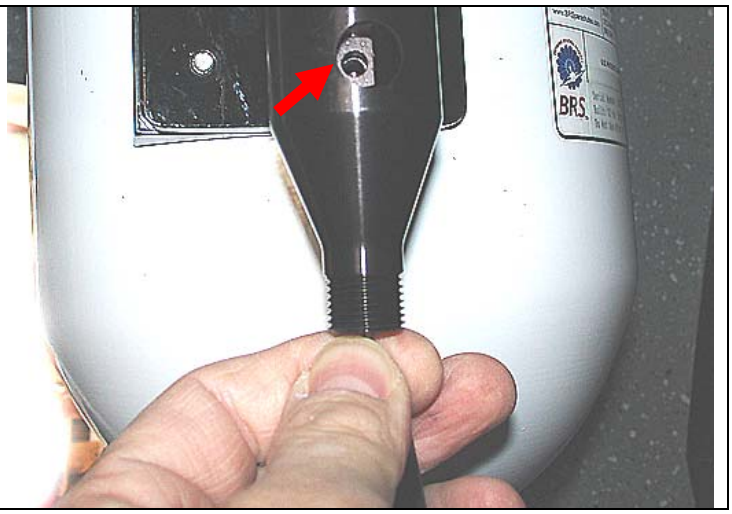
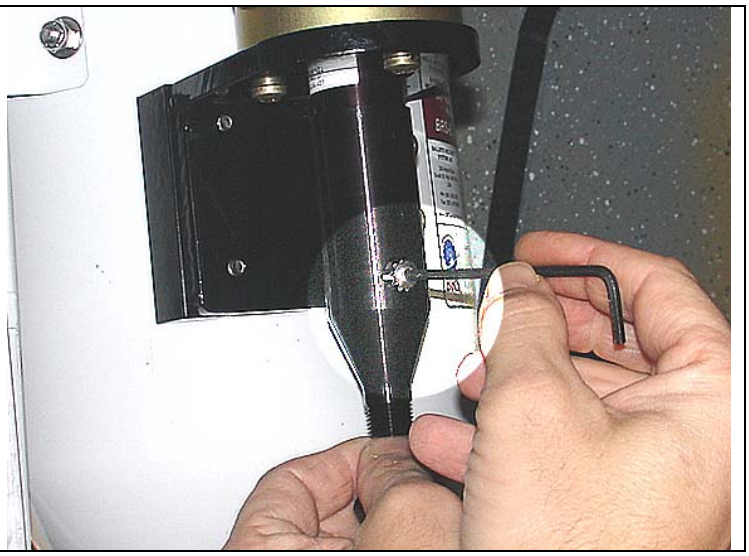
5. ACTIVATION HANDLE AND HOUSING INSTALLATION.

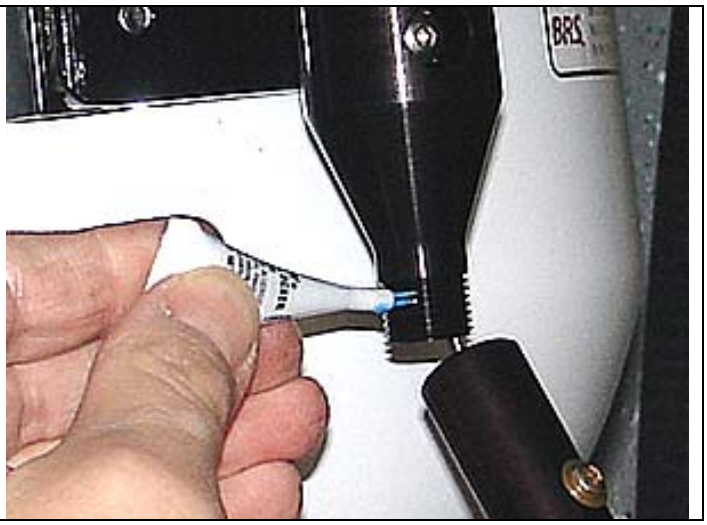
5.1	From cockpit side of bulkhead, pass small end of Activation Housing through the hole in aircraft back wall and attach Activation Handle using one Screw (item 15), two Washers (item 23) and one Lock Nut (item 22).	
5.2	Route Activation Housing through the big square hole in control tunnel towards the Parachute.	
5.3	Route Activation Housing as shown, securing routing with Cable-ties in locations shown. Cable Housing is routed behind Lexan Screen.	

6. CONNECTING ACTIVATION CABLE TO THE ROCKET.

WARNING: **Make sure to insert Safety Pin with Flag into Activation handle before Connecting Activation Cable to the Rocket.**



6.1	Grasp the Activation Cable close to the Cone Adapter and insert loop into slot at aft end of Rocket Actuator.	
6.2	Insert loop into slot at aft end of Rocket Actuator. Make sure that cable loop is visible through hole in Actuator. (May need to use the flash light to see this).	
6.3	When cable loop is visible through the hole in Actuator, secure Activation Cable with Screw (item 3) and Lock Washer (item 4).	

6.4	Apply ***242 LOCTITE*** to threads on Rocket Cone.	
6.5	Screw Cone Adapter to Rocket Cone.	
6.6	Install Plastic Cap (item 2) to access holes. Review this installation.	

7. PLACARD PLACEMENT.

7.1	Place “DANGER” sticker (item 25) centered on egress panel on top of aircraft. Points towards front of aircraft.	
7.2	Place “WARNING” sticker (item 26) on left hand side of aircraft at upper aft corner of the door.	
7.3	Place “WARNING” sticker (item 26) on right hand side of aircraft at upper aft corner of the door.	

7.4	Place “WARNING” sticker (item 26) on pedestal above Activation Handle.	

DANGER: REMOVE SAFETY PIN WITH FLAG FROM ACTIVATION HANDLE BEFORE FLIGHT !