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Revision A

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS for the BRS-2400 on RV10

Release Date: September 2018

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for the BRS-2400 on RV10

ABSTRACT

These instructions were created in cooperation with JAZZ AERO

These instructions supplement the **"BRS Owner's Manual and General Installation Guide"** which is provided with this unit. It provides additional direction relating specifically to the BRS-2400 parachute system installed in the RV10.

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REVISION PAGE

Rev	Date	Author	Check	Approval	Description
A	2018-09				Initial release

Tab. 1 – Revision Table

Fig. 1 – RV10 Aircraft

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1 INTRODUCTION

The BRS-2400 Recovery System is a rocket deployed emergency parachute system designed for use on the RV10 aircraft. It is designed to recover the aircraft in life threatening emergency situations, lowering the aircraft and occupants to the ground in a controlled descent.

The BRS-2400 parachute is enclosed in a cuboid form pressure packed deployment bag seated within a canister in the baggage compartment. The parachute is attached to the airplane primary structure with a 4-point harness assembly fabricated of flexible woven Kevlar bridles. The front harnesses are connected to engine mounts in the front of the firewall, underneath the engine cowling using larks-head knots. The two rear harnesses are each connected to additional shorter harnesses which are contained in the aircraft and attached to the floor in the rear of the aircraft. The front harnesses are routed externally along the skin of the fuselage into the egress area and covered with fairings. The rear harnesses are routed from the floor of the aircraft to rear attachment hardware, where they connect to the longer portions of the rear harnesses. The excess rear harnesses are S-folded on top of the packed parachute. When the system is activated, the rocket will blow through the fiberglass egress panel and extract the parachute away from the airplane. The deploying parachute peels the harness sections away from the fairings securing them to the aircraft, allowing for full pay-out.

The system is activated by pulling an activation handle mounted between the occupants in the cockpit. The handle assembly is the only part of the system in the cockpit area itself, the rest being in the baggage area. A safety pin and "Remove Before Flight" flag is supplied to safety the system when not in use or in maintenance.

A single, deliberate action is required for activation, assuming the safety pin and flag have already been removed as required for flight. The handle activates the rocket motor via a braided stainless-steel cable routed through a Teflon, lined housing. The first few inches of motion deliberately take up slack within the cable housing. The remaining motion simultaneously arms the igniter and fires it. The rocket motor igniter, which is a mechanical device that requires no electrical source, is unarmed in the normal configuration.

2 AIRWORTHINESS LIMITATIONS

Installation and field servicing of the BRS-2400 must be performed by appropriately licensed and authorized personnel in accordance with BRS Installation Instructions for the RV10. Annual/100 hours' inspections must be performed by appropriately licensed and authorized personnel in accordance with the instructions outlined in this specification.

The following life limits apply to the BRS-2400 system when installed on the RV-10 aircraft:

2.1	BRS-2400 PARACHUTE REPACK INTERVAL	10 Years
2.2	BRS ROCKET REPLACEMENT	10 Years
2.3	MAXIMUM PARACHUTE SERVICE LIFE	20 Years

These service dates are printed on placards enclosed in a placard window on the retaining strap of the packed parachute and a sticker on the rocket. Any repairs, repacking, or replacement of the BRS-2400 system must be performed by BRS Inc. or BRS Authorized Service Center. The Annual/100 hours' inspections may be performed by appropriately licensed and authorized personnel at the designated intervals.

Using the BRS-2400 for an actual inflight use will render the aircraft un-airworthy, until returned to service by the appropriate authority. The BRS-2400 Parachute Assembly is intended for (1) use only. If the BRS-2400 is deployed, for whatever reason, BRS Inc. must be informed about it as soon as possible. The company tracks all uses of BRS units to see how and why it was used, what the results were, what injuries or damage may have resulted, and if any improvements to the device are possible, once the learning experience is gained.

Inform BRS Inc. immediately, following any active use of the BRS-2400 system.

3 REFERENCES

3.1 RV10 Parachute Installation Manual XXXXXX-PM

4 ALTERATION OF FACTORY INSTALLATION

Unauthorized personnel should not tamper with, or attempt to modify, repair, or disassemble the BRS-2400 system at any time. BRS has gone to considerable effort to ensure that the system will function reliably. Any change in its installation may render the system incapable of proper operation.

Modification of any component part of the BRS unit, or failure to strictly follow the procedures and directions set forth in this manual, can result in deployment failure and personal injury or death to the pilot and passengers aboard the aircraft!!

5 ANNUAL/100 HR INSPECTION PROCEDURES

(Refer to the appropriate Installation Instructions while working on the BRS-2400 system.)

Treat the Rocket of BRS-2400 like a loaded gun. The Rocket Assembly at rest is in an "un-armed" condition. Arming takes place in the same motion that activates the system. Take all appropriate precautions to see that other persons cannot tamper with the activation system. At least 40-55 pounds of pull force at the Handle, is required to activate the Rocket.

Do not "experiment" with the BRS-2400 system or activate it while on the ground just to see if it works. People may be injured, property damaged, and significant cost will be incurred to repack the parachute and replace the rocket. In addition, activation of the BRS-2400, even experimentally, will render it and the aircraft inoperable until BRS Inc. has serviced it and the aircraft repaired.

The following checklist describes the annual/100 hr inspection procedures. If the BRS-2400 is damaged, it must be removed and returned to BRS Inc. or authorized service center (without the rocket) for inspection, repair and repack. If the structural or functional integrity of any of the BRS-2400 components are questionable or water contamination is suspected, contact BRS Inc. for maintenance instructions.

EXTERNAL INSPECTION:

1. Inspect the seal around the entire perimeter of the Harness Fairings. The seal should be free of cracks and securely adhered to its respective surfaces. Inspect the Fairings for damage or cracking.
2. Remove the engine cowl and inspect the Front Harness Attachment point. Check for evidence of leakage (i.e. stains, moisture, etc.) through the harness exit slots in the engine cowling.
3. Inspect the cockpit accesses to ensure "Ballistic Warning" labels are present and legible.
4. Inspect the exit area to ensure "Stay Clear" label installed and legible.

INTERNAL INSPECTION:

5. Install the safety pin with "REMOVE BEFORE FLIGHT" flag in the activation handle.
6. Rotate the activation handle in its holder to ensure its free of corrosion.
7. Look for evidence of leakage (i.e. stains, moisture, etc.) around the cutout in the egress panel.
8. Check for wear, cuts, tears, and/or abrasion of textile components.
9. Check for dents, breaks, and/or corrosion of metal components.
10. Check parachute canister base for secure fit with the baggage compartment floor. Ensure that all mounting screws and rivets are tight by manually trying to move BRS assembly on mount. Be careful not to move the activation assembly too much as to avoid accidental deployment.
11. Inspect the rocket fiberglass tunnel for damage or cracking.
12. Check for a secure fit of the rocket to its mounting plate. Ensure that all mounting screws are tight by manually trying to move rocket assembly on mount.
13. Using flashlight, visually check presence and security of screw which retains the activation cable within the igniter. Screw head is visible through access hole in side of rocket cone.
14. Check for a secure fit of the pick-up collar to the rocket. Ensure the aluminum shear screws are secure.

6 REMOVAL OF BRS-2400 PACKED PARACHUTE ASSEMBLIES FOR SERVICING

Please refer to appropriate Installation Manual for details.

6.1. Install the "Remove Before Flight" flag and Safety Pin, prior to working on BRS-2400 unit.	 Fig. 2 – Activation Handle, secured

Comentado [SH1]: Picture inside the cockpit would be better

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6.2. Remove the screws of the canister top plate, remove the pins of the piano-hinges and remove the top of the canister from the aircraft.	  Fig. 3 – Removal of canister top plate

6.3. Remove the bolts and nuts which secures the harnesses to the 3-point shackles. It may be necessary to loosen the other nuts as well. Retain all removed hardware. Do not remove the 3-point shackles from the parachute.	 Fig. 4 – Disconnection of harnesses

6.4. To disconnect the parachute from the rocket, pull the yellow sleeve that cover the lines that connect the pick-up collar to the parachute, and disconnect the link (as shown on the first and second image).	

Fig. 5 – Removal of canister backplate

6.5. **Warning**: Check that the safety pin is installed on the activation handle! Remove the small plastic cover from the side of the rocket cone to expose the top of the 10-24 screw. Disconnect the activation cable from the igniter by carefully removing the screw and star washer from this access window.	 Fig. 6 – Disconnecting activation cable

6.6. Unscrew the cone adapter (small black cylinder on end of activation assembly) from the end of the rocket cone. May require a wrench to loosen.	 Fig. 7 – Cone adapter removal

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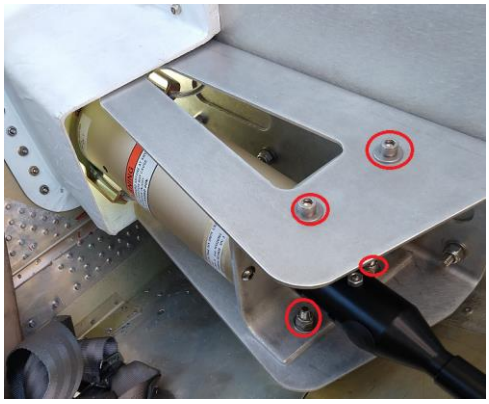
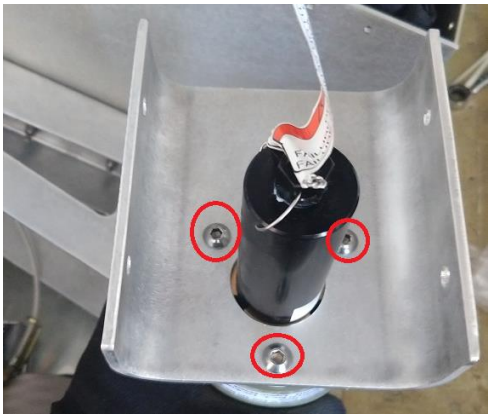
6.7. The rocket cone must be removed from the igniter before the rocket can be removed from its mount. Remove the two screws which secure the cone to the igniter, and gently remove.	 Fig. 8 – Rocket Removal from Pedestal

6.8. Remove the 4 screws securing the rocket base to the rocket mount. Carefully slide the rocket, which is still attached to the pick-up collar and to the rocket base, backwards and pull the steel cables trough the opening on the side of the canister.	 Fig. 9 – Disconnecting rocket base from mount

6.9. Remove the two aluminum 8-32 special screws that attach the pick-up collar to the launch tube assembly and discard them. Slide the pick-up collar off the rocket motor.	 Fig. 10 – Disconnecting the pick-up collar

6.10. Remove the 3 screws securing the rocket base to the rocket mount. After removing the rocket from the mount, run the screws back into the rocket base to avoid misplacement.	 Fig. 11 – Disconnecting rocket from the base

Comentado [SH2]: This is a 601 rocket, a picture of this step inside the RV10 of the 901 rocket (which protrudes further past the pick-up collar than the 601) will be more clear

6.11. To safely store the rocket assembly, re-install the rocket cone to the igniter. This will protect the actuator.

Re-secure with the two previously removed screws.

DO NOT pull on the actuator, doing so will activate the igniter and launch the rocket if it is still attached!

Contact your BRS Service Center how to handle the rocket after operation time.

WARNING!

It is forbidden to ship pyrotechnical units by any means.

It is forbidden to handle pyrotechnical units without certified qualification.

Store the rocket in a safe, cool and dry place.

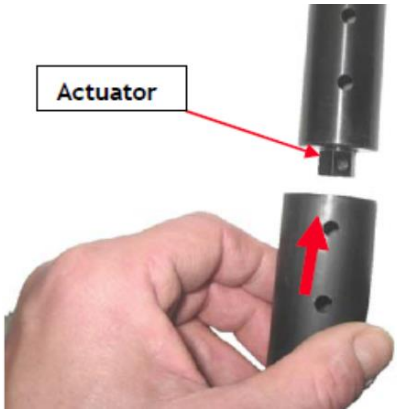
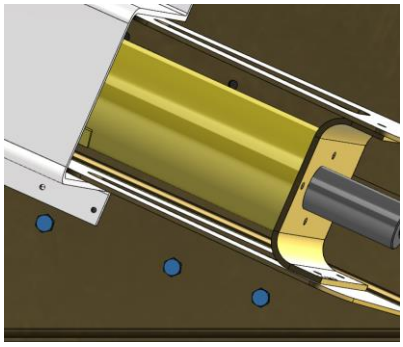
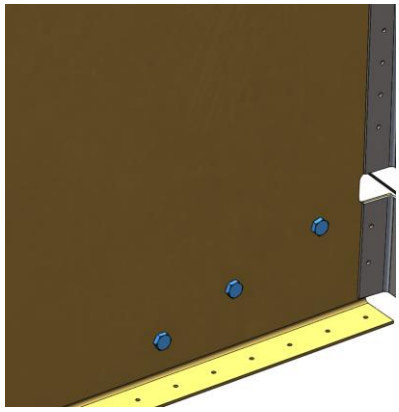
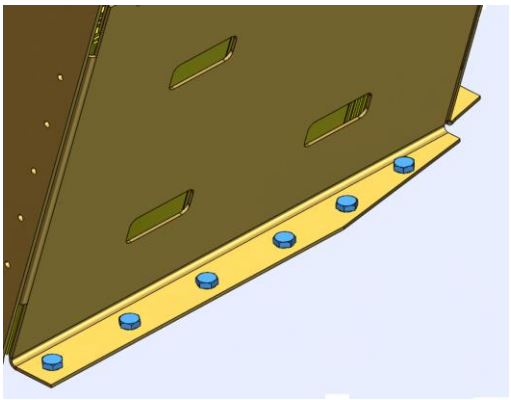
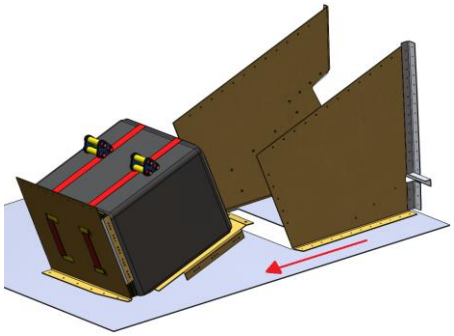


Fig. 12 – Safely storing igniter

6.12. Using a long screw driver, remove the five screws from the edge of the canister parachute shelf (along the red line of the upper image). Afterwards, remove the six screws (three on each side) of the canister rocket plate (the three highlighted screws on the second image) and canister side plate (the three highlighted screws on the third image). Remove all the pan head screws which attach the canister back plate to both side plates. **Tip**: remove the backseats of the aircraft for easy access.	   Fig. 13 – Removal of canister plates

6.13. Remove the hexagonal head screws of the canister back plate attaching it to the aircraft baggage floor (the highlighted screws on the image).	 Fig. 14 – Removal of canister backplate screws

6.14. Carefully remove the packed parachute from the aircraft. Pull it upwards and backwards to release it from the canister. The unit is installed with some interference inside the canister, hence some force is required to slide it out. Loosen the straps under the parachute to separate it from the canister plates. Reinstall the pick-up collar removed on step 6.3 to the packed parachute and ship the unit to BRS for inspection. **DO NOT** ship the rocket together with the parachute. ***Portions of aircraft cut-away for clarity***	 Fig. 15 – Removal of canister backplate

Return only the parachute to BRS for inspection!

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7 RE-INSTALLING ROCKET AND PARACHUTE AFTER SERVICING

7.1 To reinstall the parachute after the inspection and the new rocket follow the same steps listed in Chapter 6 but in the opposite direction. Reefer to the parachute installation manual in case of doubts.

End of Document