Assembly Instructions

Thank you for purchasing the Wildman 2nd stage upgrade rocket kit, and welcome to the Wildman family. You are now an official Wildman or Wildwoman.

This all fiberglass kit features the latest in spiral wound airframe tube yielding superior performance in a large span of parameters from sub to mach plus flights. If built according to theses instructions, it has a lifetime guarantee.

Open and inspect for damage, make sure all parts are enclosed.

Now for the rules

The Wildman 2nd stage upgrade comes with a lifetime warranty against defects and flight failure if built according to the instructions and flown on commercial made motors. The warranty does not cover recovery failures or lawn darts.

To qualify for the warranty, the following guidelines must be followed:

- Epoxy: West Systems, Pro Line, or Aero epoxy must be used for build. If another brand is used you must call first for approval.
- Launch lugs [conformal or tube] or rail buttons are ok.
- Chopped Carbon fiber or Kevlar pulp must be used. One or the other is mandatory.
- Hobby epoxy (10-15 minute etc.) and CA (super glue) may be used for tacking purposes only.
- 3 altimeter bay vents holes. 1/4 diameter, are recommended, however 1 vent hole1/2" in diameter may be substituted.
- Warranted for use with commercially made motors only.

To complete the build, you will also need:

- A syringe for injecting epoxy. Available at Wal-Mart pharmacy or most other drug stores. Purchase the type used for giving liquids to small children.
- Rail buttons or launch lugs.
- Epoxy, chopped carbon fibers or chopped Kevlar pulp, and filler such as West 406 Colloidal Silica for thickening external fillets
- Drill and bits- 5/32" for rivets,1/4" for altimeter bay vents, 5/64" for shear pins and 1/8" for airframe vents.
- Parachute and optional altimeter.

- Motor retention- Aero-Pac, Slim line, T-nuts and mirror clips, etc can be used.
- Denatured alcohol for clean-up.
- File (optional), sandpaper, 60-80 grit for roughing up before glue, 120- 400 for paint and finish.
- Primer and paint.
- 10 minute epoxy, WEST SYSTEMS or equivalent.
- Fin alignment guide.

One of the unique construction concepts to this kit will be injecting the interior fin fillets. This has been time tested and proven in countless high power flights up to N class motors with no failures to date. If built in this manner, your rocket will not require any type of added reinforcement, such as tip to tip or internal fiberglass strips. Your build will be light weight and flight worthy, able to handle any commercial motor available that will fit!

MOST IMPORTANT

Sand all parts that will come into contact with epoxy with 60 or 80 grit sandpaper.

- Fin root and up each side of the fine to a height of 1 1/2"
- Centering rings.
- Exterior of motor mount tube.
- Inside of airframe where CR's will contact.
- Bulk plates that will be glued together for altimeter bay.
- The inside of the vent band and the outside of the coupler that it will be glued to.
- Lightly sand the fin slots to remove burrs from cutting and dry fit the fins. All this will be made clear during build.

The following abbreviations will be used during construction:

Centering Ring = CR Bulk Plate = BP Tubular nylon = TN

Motor mount tube = MM Body Tube=BT

READ THESE INSTRUCTIONS ALL THE WAY THROUGH FIRST THEN COME BACK AND BEGIN YOUR BUILD!

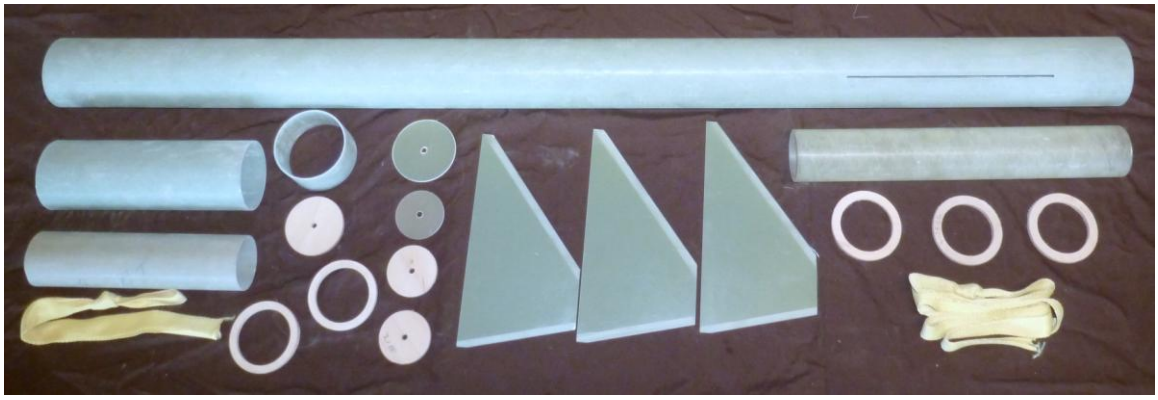
Wildman 2nd Stage Upgrade kit for the 3in Wildman Rocket

This kit turns your 3” Wildman into a 2 stage Rocket. You will use the fincan of your original rocket for the booster. This kit supplies you with a new fincan that will become your sustainer. The fins are now 3 inches forward of the rear of the airframe to accept the interstage coupler from the booster.

Sustainer Parts:
3” Airframe
3 fins
54mm Motor Mount
3 Centering rings
Kevlar strap for recovery mounting.

Interstage Coupler Parts:
Coupler
Vent band
Altimeter bay
Bulk Plates
centering rings
Small Kevlar strap for recovery mounting

Optional items 3/16th ridged brake line



There is little room for error in this build, so a lot of dry fitting is needed to get everything lined up. When finished less than a 1/4 inch in positioning can make all the difference between fitting and not.

Everything needs to be checked and re-checked!

MM sub assembly:

The only non-standard thing required for the build is the conduit for the 2nd stage ignition match/igniter. There is only 1/4 of web on the CR's so unless you want to notch it, you must find something else adequate. 3/16th ridged brake line fits perfectly, which can be found at any local car part store.

To utilize the brake line cut off one end with hacksaw and remove 1 flange and the threaded couplers.

Sand the outside of the MM and the inside of the airframe where the CR's will make contact with 60 or 80 grit sandpaper. Sand the 3 centering rings so they fit over the MM and inside the airframe.

Line up and drill the 3 large Cr's with a 3/16 bit for conduit.

Lay Kevlar strap for recovery harness across CR's and mark.

Transfer the marks to the inside of the top CR and file notches for the recovery harness.

The best way to mount the CR's is to string the CR's on to the conduit and slip the MM through them.

Make sure the brake line is mounted as close to the retainer as possible so fishing your lines will be easier.

Now is the time to dry fit motor retention and adjust if needed. It is recommended to fit a motor in place to be sure alignment issues have been addressed. There is nothing worse than completing a project, only to find the motor won't fit due to an overlooked error. **SO CHECK IT NOW!** If using clips and T-nuts mount them now. Putting grease in threaded holes will prevent epoxy from ruining them during the build. In this case [using Aero-Pac] it has been mounted on the MM now.

Slide MM assembly into the airframe and trace all 3 slots on MM. Be sure that the conduit does not interfere with the fin slots. Number each slot, fin, and mark it on the BT. While dry fitting, sand slots if needed, this makes sure all will go back together smoothly when gluing. Remove the MM and mark the corresponding fins on the MM, stand on its end.

Tack the bottom CR in place. Then place the fins in their correct numbered positions and slide middle CR down on to them to hold them on. You may need an extra pair of hands for this step if your CR is a loose fit. When CR is firmly positioned on top of fins, tack CR in place with a few drops of CA.

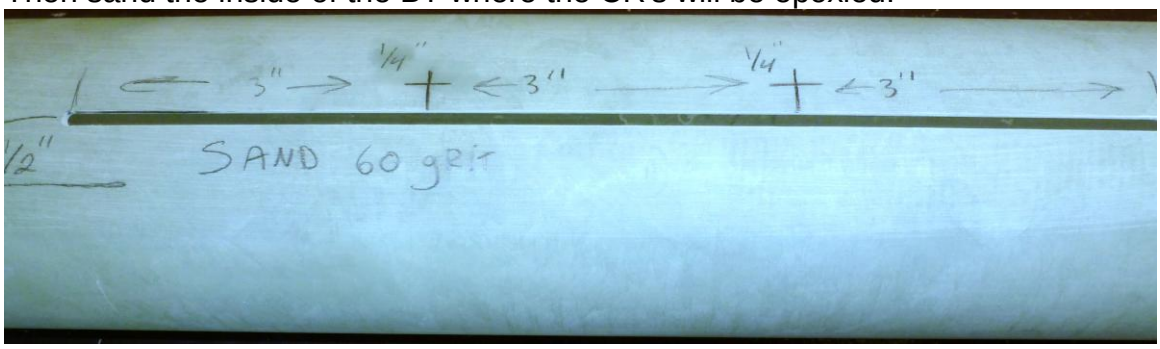
MAJOR TIP: [INJECTED FILLETS] You will be injecting the internal fillets for the fins. The fins must fit tight to the MM, and the CR's must fit snug to both ends of fins. You are creating a dam so the injected epoxy cannot leak under the fins, or around the fin/centering ring joints. Any gaps and you will have epoxy leaking out of the fillets!

Remove fins, insert MM back into airframe, and check the fit with fins in place. Make any needed adjustments, remove then fillet top of the middle CR.

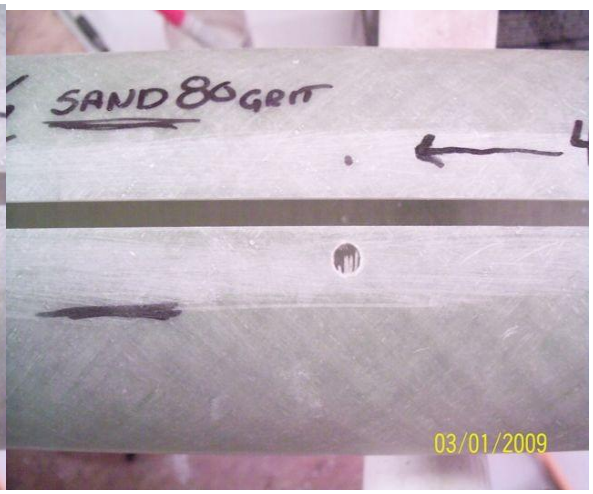
Install the top CR (with the recovery harness notches) and the recovery harness to the top of the MM. Mix some epoxy and smear on the MM under the straps, push them into the epoxy and put more epoxy on top of the strap. [Encapsulate it] Repeat for the other side of the strap. Make a small fillet with epoxy around the top of the CR, just enough to seal any gap between the CR and tube.

Injecting Internal Fillets:

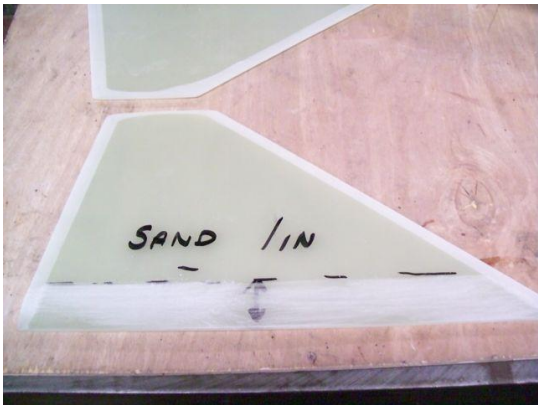
Sand both sides of 3 slots out ½" from edge of slot. [For fillet adhesion] Drill ¼ " holes on both sides of 3 slots, 3" from each end. Center hole ¼" from the edge of the slots. Then sand the inside of the BT where the CR's will be epoxied.



Tip: Sand fuzzies off holes left from drilling, if needed use dowel with sandpaper taped on, to reach inside. If left, when injecting the carbon fiber mix, the fibers will collect on them, clogging the holes.



Fin mounting: Slide the MM assembly into the airframe; make sure the numbered slots, fins and motor mount lines are correct. Sand both sides of 3 fins with 60-80 grit, 1in. up from root edge.



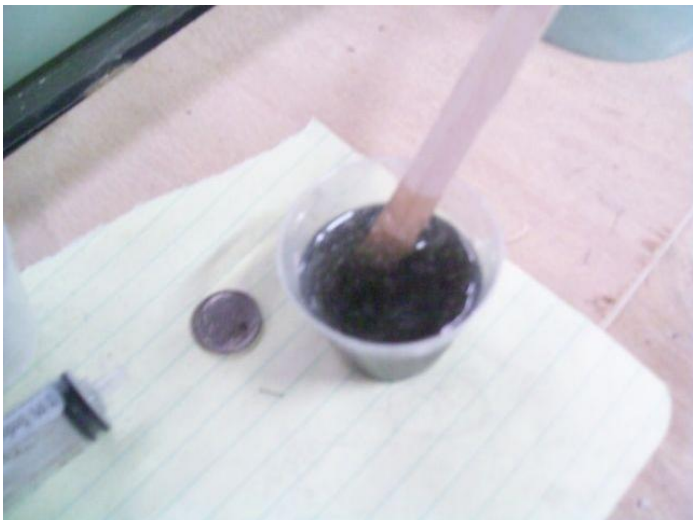
To tack the fins in place for injecting; butter root edge of fin 1 with bead of 10min. epoxy; add a small dollop on each end where fin will contact CR's. Push into slot 1 and onto line 1 on MM tube. Make sure the fin is down all the way tight. Repeat for fins 2 and 3. Make sure you are careful and have proper alignment. Check on fins regularly for slippage till epoxy cures. You may have to tape the fins into position if they are a loose fit and won't stay put.

Tip: Remember when mounting fins to get the alignment correct. This is imperative for straight flights!

Airframe should be level for the injected fillets. Use rack or hang over edge of table/workbench and check for level both side to side and front to back.

Mix 30ml of West Systems, [or equivalent] epoxy for injecting 2 fillets. Mix with hardener then add the chopped carbon fibers. A 10ml syringe is available from Wildman Hobbies. You may have to cut the tip to a 45 angle, to make it work better. A small pile of chopped carbon about the size of a dime should be added. It doesn't look like much, but after stirring into the epoxy, it will separate and be quite thick.

Stir for a good minute or two.



Then pour into the syringe. You will be putting approximately 15ml or cc [they are the same] in each fillet total. Divide the 15 ml equally between both holes on one fin. Then repeat (after each fillet has cured) for a total of 6 fillets, 1 on each side of the fin.

Tip: There is less than ½ " between airframe and MM tube. When sticking syringe tip into hole, it is easy to get so close to MM that if you inject to rapidly the epoxy will backsplash off the MM all over the inside of airframe. Take your time and be careful!

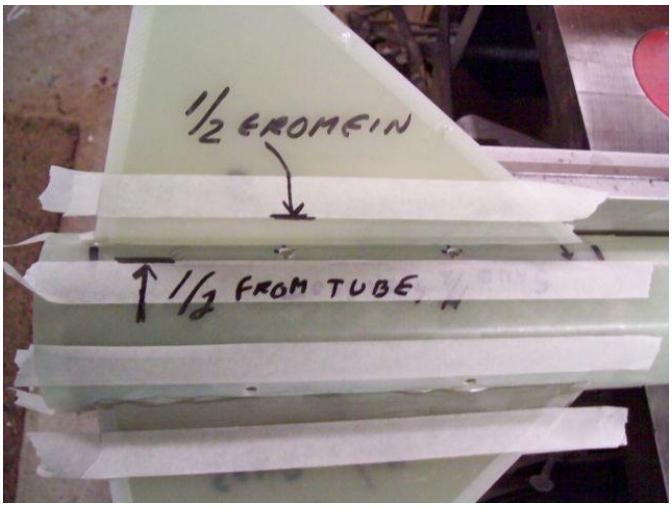
Tip: Tip the airframe up slightly for a few moments then down. This will help disperse the epoxy more evenly.

Peek into rear and you can see if it flowed evenly and check the finished internal fillets.

Block both sides of airframe so it can't move and make sure it's level so fillets cure evenly.

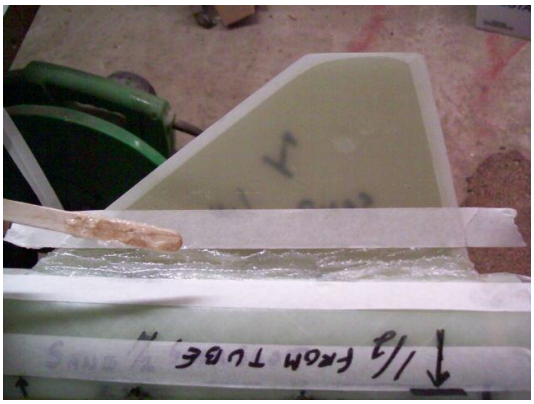
Clean syringe with alcohol to re-use between injecting fillet sets. When cured move on to the 2nd and 3rd set.

External Fillets:
Measure ½ " from the tube up the fin, mark and tape, then from the fin out ½" on the BT and tape. This will keep excess epoxy from messing up fins and the BT during fillet work.



A thickening agent must be added to the epoxy for external fillets. Several products will work, West 406 colloidal silica is what we use. I mixed in 6 times the amount shown to get the consistency needed [like peanut butter]. Mixing thoroughly each time before adding more. The smoother and more lump free the mix, the less sanding will be needed when cured!

You will need a dowel, pipe section or other round object to pull out the fillets. ¾ in to 1in. diameter will work. Add some mix to fillet in small amounts, checking with tool [dowel] so you don't overfill



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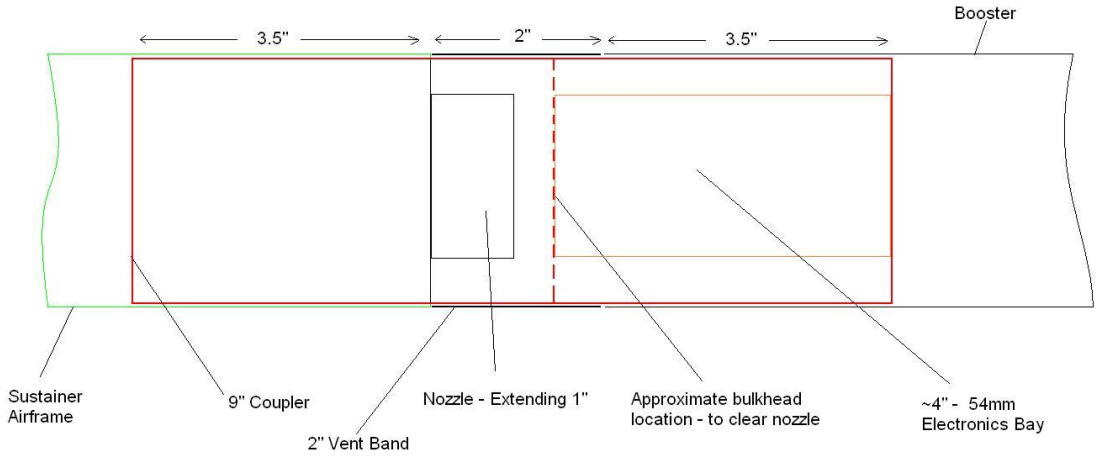
When enough has been added to form a fillet, start at front of fin. Make a slow even pull, applying same amount of pressure, no stopping from start to finish. If there are low spots or misses, add some filler and repeat process till you get it right. Keep your tool clean and moistened with alcohol.

Finished fillets will look like this. Removing the tape is easier if done when epoxy reaches mid cure, it is much harder to remove after full cure.

Building the Interstage Coupler

Dry fit the interstage coupler/Av-bay to get a feel for how it goes together.

When gluing the Interstage coupler leave at least a 1 1/8 inch clearance from the motor retainer to the BP to accommodate longer nozzles; or the Interstage couple will not sit flush with the rear CR of the sustainer.



Use an eyebolt to center the coupler BP to the inner 54mm coupler BP and glue them together. Then remove the eyebolt and tape over the hole it will be filled with epoxy soon.

Place this assembly on top of the spacer.

Carefully slide the interstage coupler down over the BP's. Make sure it is hitting the CR on the sustainer and NOT catching on the igniter tubing.

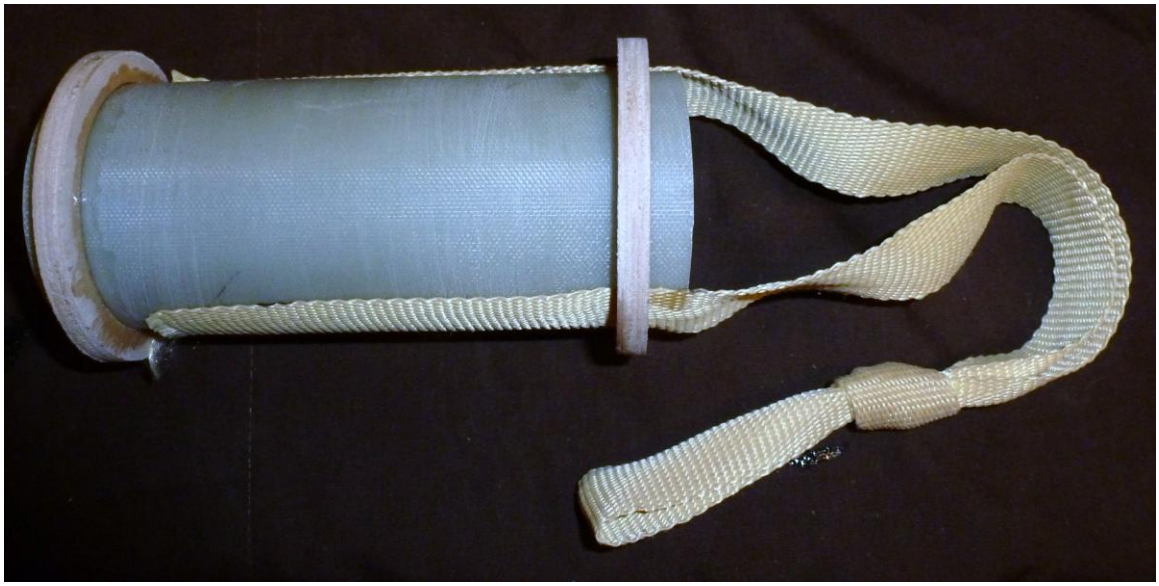
What it should look like, all properly spaced for the biggest motors/longest nozzles out there (Looking at it from the altimeter bay side). The 54mm tube [Av-bay] will fit over the smaller BP. Tack with superglue to secure the position. Remember the interstage Av-Bay has to fit over the smaller BP.

On the reverse side you can pour epoxy on to the BP to secure it in place.

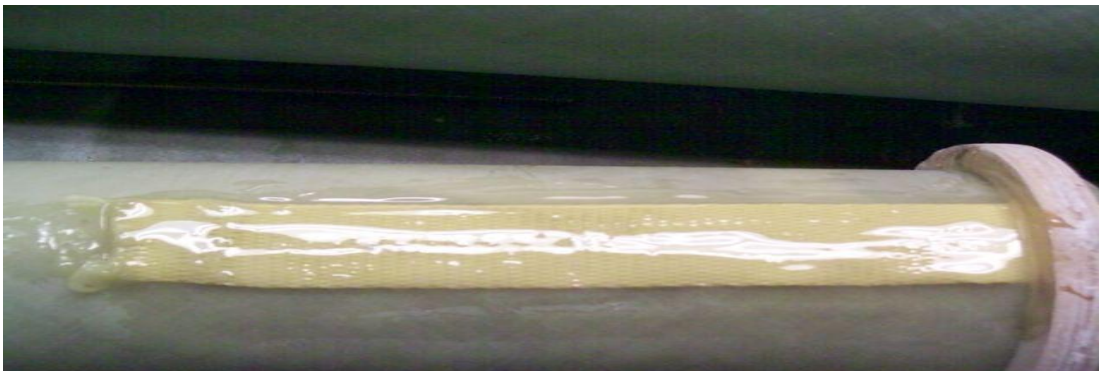
Av-bay for interstage coupler:

This av-bay allows you to put electronics in the interstage coupler if desired.

Dry fit the 54mm tube and CR's to fit the interstage.
The bottom CR should be about a ½" from the end of the tube. Tube will fit over glued in BP.



The top CR on the 54mm tube should be just below the edge of the interstate coupler for a nice fillet. Tack the CR's in place with super glue. Encapsulate the recovery harness and fillet the side of the CR facing the harness.



Do not attempt to glue other side. It must remain clean to seat to the 2 inner BPs already mounted in the coupler!

Set aside to cure

Glue up the removable cap for the av-bay.

Stack the G-10 BP on a eyebolt [to line things up] spread glue on the BP.
Add first wood coupler BP,
spread glue and add the second wood BP, tighten nut slightly to hold this assembly together.
It is this thick because when finished it will be held in place with 2 screws from the sides.

When cured remove the eyebolt and fill hole with epoxy, so the av-bay will have an airtight seal.

To secure the Interstage Av-bay assembly to the interstage coupler assembly, apply epoxy to the interstage BP. Slide this assembly in to the Interstage coupler and seat it to the BP.

Finally glue a fillet around the top lip

When cured, place cap on. Drill 2 holes opposite each other for screws to hold cap on the av-bay.