## *JBob* Design and Installation Guide

This guide walks you through the design considerations and installation of GroupJ's *JBob* Bicycle Frame Couplings (BFCs) to convert your steel frame into a world travel bike. We recommend that you read this guide thoroughly before starting your conversion and **Contact Us** with any questions before you begin.

### Design

The primary consideration for frame conversion is the location of the couplings and the routing of control cables around the couplings. If your frame has internal routed cables it is recommended that you convert to externally routed cables. Use of the Ritchie shift cable couplings is a straightforward method of breaking the shift cables. We recommend that the brake cables remain continuous and just remove the brake caliper assemblies to break apart the frame. (A disk brake bike would use the same approach).

BFCs are generally located on the upper and down tubes as close to the seat tube as practical, see Figures 1 and 2. Before you cut your frame apart, it is recommended that you select your travel case (see SandS.com) and make sure your break-apart frame will pack into the case. Larger frames are a challenge to pack and sometimes require more than 2 couplings. Scale drawings of the case and frame are recommended.

**Figure 1. BFC locations chosen to make approximately equal size frame triangles**

**Figure 2. Cables are routed around BFCs**

### Considerations for BFC placement:

#### Packing in the travel case

- Small movements in coupling location can make a big difference in the ability to fit the frame in the case – plan carefully, see Figure 3.

**Control cable routing**

- The rear brake cable usually routes outside of the top tube coupling. If the coupling is close to a cable bracket, make sure there is room for a smooth cable path with large bend radii
- Think about how to route the rear brake cable so as not to foul the rider
- The front and rear derailleur cables generally route outside the down tube coupling. Place the Ritchie shift cable couplings well clear of the BFC
- The outer shift cable usually terminates at the down tube shift bosses on vintage frames. If you are shopping for a frame to convert look for these bosses. If your frame does not have them, use a clamp-on cable stop available at bike shops or on line.

**Figure 3. Holland Cycles' beautiful "Jet Bike" in an SandS case**

*JBob* **Final Placement**

- Ensure the BFCs are not too close to adjoining tubes, brackets or lugs. GroupJ BFCs require a length of 60mm of constant tube outside diameter (OD), without obstructions, for installation
- The BFC selection table lists the length of tube to be removed for each coupling size. Use these lengths to identify two cut lines for each tube. The centerline of the coupling will be equal distance from these two lines.

**Frame Preparation** (see the SandS video link on GroupJ BFC page – coming soon is GroupJ video)

1. Strip frame of all components
2. Locate the two cut lines for each *JBob*
3. Remove all paint within 38mm (1.5in) of each line
4. Measure the tube Outside Diameter (OD) at the cut lines with a good caliper or micrometer in several places around the tube to get a good average OD

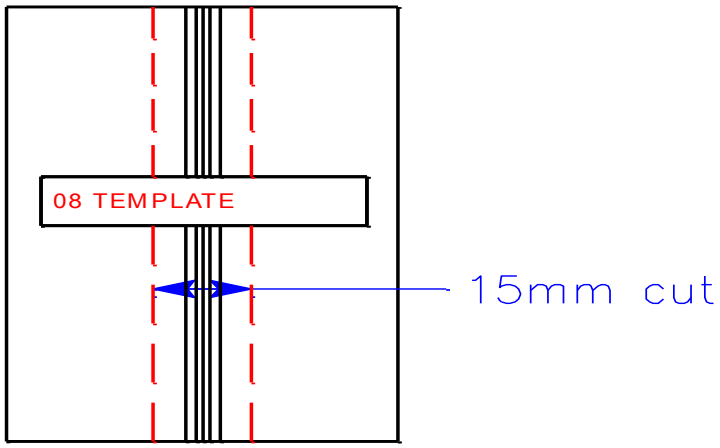
5. Choose the correct coupling size for each tube. *JBobs* come in two sizes: 08 and 09, for 1, and 1 ⅛ inch OD tubes respectively. *JBobs* are designed to slide fit over a perfectly round tube, with a 0.005 in diametric clearance. If your tubes measure slightly larger than 1 or 1 ⅛ inch, that is not a problem. You can reduce the tube diameter for a clearance fit. *JBobs* are not recommended for AVERAGE tube ODs less than 0. 980 in. for 08 or less than 1.105 in. for 09. Contact us for a custom *JBob* size.
6. Print this file and cut out the paper profiles for each selected *JBob* size and wrap them around your frame at the centerline of the *JBob*. The template should wrap around the tube with minimal overlap or gap. Insure that there are no frame parts that will interfere with the coupling. **Work around any interferences before you cut your frame!**
7. Make four perpendicular frame cuts (hack saw or abrasive wheel works well), at the cut lines and de-bur all outside/inside edges. Wrap electrical tape around the tube with the outside edge marking each cut line to guide your cut and keep it perpendicular.
8. From the tables select your *JBobs* and options/parts and place your order. Select the "D" or "P" options as desired. Don't forget to order enough clamps for brazing.
9. Carefully unpack your couplings. The couplings are assembled with a clamp (if clamps were ordered). Do not mix coupling halves.

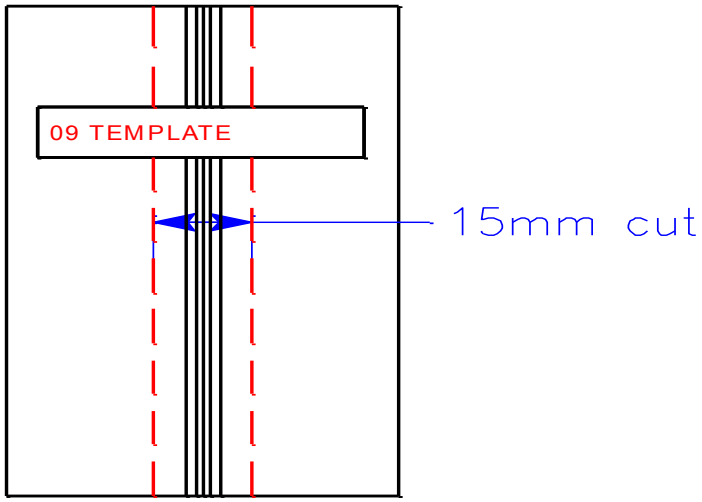
**Coupling Installation: please read the following steps through before starting**

1. Start with the frame half with the top tube Ferrule side (or seat tube side if no top tube Ferrule).
2. Clean the tube down to bare metal for a length of 38 mm (1.5 inches) from tube end.
3. Test fit the coupling. If the coupling will not slide over the tube with hand assembly, use a flat file to carefully file the OD of the tube until the BFC can be installed by hand. (The 3M pad with tool in a die grinder is great for careful diameter reduction. For a clean look, finish the tube with emery paper/cloth with action perpendicular to tube centerline).
4. Apply flux to the ID of the *JBob* and OD of the tube. Slide *JBob* half over the end of tube, making sure the tube end butts up against the Ferrule on the ID of the coupling. If you are not using Ferrules, make sure the coupling mate line is halfway between your frame cut lines. Mark this position to ensure it does not move during brazing.
5. Rotate the coupling to align to lug pattern.
6. If installing one alignment ferrule, it is recommended that the male end be on the seat end of the top tube coupling. If installing two ferrules it is recommended that the second male end be on the fork end of the bottom tube coupling.

7. Wrap the frame close to the coupling with damp towels and tape in place to minimize the heat damage to the existing paint. If you are going to powder coat or repaint the frame, skip this step.
8. Apply flux to the gap between the *JBob* and tube
9. Heat *JBob* /tube to a very dull red color (recommend you do this without welding googles so you can see when coupling just starts to turn red. Heat entire coupling evenly. Apply silver braze rod. At the proper temperature the braze will completely wet the seam between the *JBob* and the tube. Work your way around *JBob*.
10. Repeat steps 2-8 for the down tube *JBob* with Ferrule. If Ferrules are not used install the down tube *JBob* on the frame half you started with. You should now have two *JBob* halves installed, one on the top tube and one on the bottom tube.
11. Cool and inspect your braze joints - if there are any gaps between the tube and *JBob*, go back and reapply a bit of flux and braze. Don't worry about areas where you got too much braze we'll take care of that at the end.
12. Clean the remaining tubes, apply flux, and slide the *JBobs* onto the frame. Make sure the correct *JBob* mate is in the proper location.
13. Remove the O-rings from a set of clamps and assemble the frame BFCs. Rotate the *JBob* to align the lug pattern. Carefully tighten each clamp a little at a time until the Ritchey hex wrench "clicks" indicating proper clamp screw torque (14 in-lbs). Install the fork and check the alignment of the front fork with the rear drop out, generally no adjustment is needed but now is the time to make sure they are in line, rotate the fork to bring them into alignment.
14. Once you are happy that the BFCs are fully coupled and in the proper location, tack braze the *JBobs* in place by applying a small amount of braze rod in three equally spaced places around a "C" *JBob*, or braze the point and lobe of a "P" *JBob*. **DO NOT FULLY BRAZE THE BFC IN PLACE.** The reason for this is that there is a chance that the silver braze material could flow to the Ferrule causing the coupling to be brazed together. After your tack joints have cooled, disassemble the couplings and complete the brazing of the couplings (If you are not using Ferrules this precaution is not necessary).
15. A 3M Scotch Brite rotating pad in your drill motor or pneumatic die grinder is used to clean up the braze joint. If you deposited too much braze in one area you can gently remove it with the pad (takes a bit of elbow grease).
16. Paint and install decals and you now have a custom travel bike frame!

*JBob* Templates


08 TEMPLATE
15mm cut


09 TEMPLATE
15mm cut