Bore Repair Systems, Inc. line of BOA portable bore welding and machining systems are designed to be the easiest to use and most reliable in the industry. They contain the features that are most important when performing construction, industrial and marine equipment bore repair.
The steps for easy bore repair using the Bore Repair System

1. Center your boring bar
The BOA BRS 1-5 systems contain a unique centering system that accurately and quickly aligns your boring bar. With the standard cone compression system and tightening wrench, it is no longer difficult to achieve an accurate center for your boring bars. Center your bar using (2) centering cones, (2) centering cone lock collars and compression assembly.

2. Slide your machine support (with reduction sleeve in place) and bar support bearing assembly over the ends of the boring bar and make a mark in the center of the rectangular cut-outs onto the piece you will be mounting to. These marks locate where you will attach your mounting studs.

3. Slide your machine support and bar support bearing assembly back towards the ends of the boring bar and weld your mounting studs (1/2-13 x 3” long hex bolt) with the hex head down.

4. Slide your machine support and bar support bearing assembly back towards and over the mounting studs you have welded onto workpiece. Supports should now “straddle” the mounting studs. Make sure the leveling screws contained in the supports all touch the workpiece when slid all the way up to workpiece. Adjust as necessary. Once leveling/adjustment screws are touching the workpiece, introduce the cross clamp supports, washers and nuts and tighten supports to workpiece, starting with machine support and ending with bar support bearing.
5. Remove centering cones, clamps and compression components by loosening the centering cone clamps and sliding boring bar out of machine support and towards bar support bearing.

6. Remove the machine support reduction sleeve.

7. Install the drive gearbox and tighten clamping screw.

8. Slide boring bar into and through the gearbox.

9. If bar slides easily through bearings and gearbox, proceed to step 10. If not, make fine adjustments on the leveling/adjustment bolts contained on the machine support. Begin with 1/16 turn in on either top or bottom two bolts. If this adjustment fails, or makes the bar even harder to push through, bring those two bolts back to the starting position (1/16 turn out) then try turning the opposite pair of adjusting bolts 1/16 turn in. This should be all the adjustment that is needed. If not, bring these bolts back to neutral and focus on the adjustment bolts that are located vertical from one another. The boring bar should slide through the gearbox and bearing with ease and should not require much force. Ideally you should be able to push bar through with your finger.
10. Thread the feed arm onto the feed screw by turning the manual feed wheel.

11. Once the feed arm is at desired location along bar (generally in a position that will give you maximum axial travel depending on the direction you will be cutting) tighten the feed arm clamp.

12. Install the drive motor into the gearbox. Be sure to align the drive sleeve on the motor to the keyed drive shaft in the gearbox. Rotate motor as needed so that control face is in a handy position for use. Tighten the two securing screws.

13. Install cutting bit in rear tool port. This will allow you to use the optional #KMT-2 ID bore measuring kit to measure the bore after you have performed your “roughing” initial cut. By using the rear tool port, you will not have to remove the cutting bit. Your tool bit “baseline” position will be maintained.

14. For bores under 4” diameter, put gearbox selector into hi range (upper slider position) and for larger bores, put gearbox selector into low range (lower slider position).
15. Place axial feed engagement pin in neutral position

16. Turn on boring bar drive motor and select proper rotation direction for cutting bit that is installed.

17. Manually begin to feed the tool bit towards the bore being machined. Be careful to slow down prior to engaging tool bit with the bore being machined.

18. Once tool bit is engaged in the bore being machined and is making a full or nearly full cut, engage automatic feed. We recommend a first “rough” cut of about .030” to .040” deep. This should be deep enough to remove the weld ridges (if you are machining a bore welded surface) or to remove surface contamination from a worn pin or bushing.

19. Once rough cut has been completed, turn off gearbox motor and put feed pin into neutral position.
20. Using the manual feed wheel, retract the tool bit to the starting position.

21. Install the square tool bit adapter (from your optional KMT-2 ID Bore measure kit) into the front unused tool port. DO NOT REMOVE THE CUTTING BIT.

22. Select the proper combination of spring loaded ends and stationary ends from your KMT-2 ID Bore measure kit to work with the bore size that you are working in.

23. Compress and lock the spring loaded end on your KMT-2 Bore measure kit and install into the square adapter already installed in the front tool port on the boring bar.

24. Feed the KMT-2 bore measure kit into the bore about 1/4 to 1/2” using the manual feed wheel.
25. Loosen the thumb screw and allow the spring loaded end of the KMT-2 Bore measure tool to expand to the ID of the rough cut bore.

26. Re-tighten the thumb screw on the KMT-2 Bore measure gage to hold the bore measurement.

27. Retract the KMT-2 Bore measure gage from the bore using the manual feed wheel on the gearbox.

28. Remove the KMT-2 Bore measure gage from the boring bar. Use a micrometer or calipers to then measure the bore gage to determine what the rough cut bore diameter is. This will allow you to determine how much more you will need to adjust your tool bit in order to finish your bore to the desired diameter.

29. Attach the KTA-2 Tool bit adjuster to the top of the cutting bit and secure with the tool’s set screws.
30. Turn the dial on the adjuster head until spindle makes contact with the boring bar then push the “ABS” button to zero the screen.

31. Loosen the set screw that holds the cutting bit in the boring bar. Tool bit is now ready to be adjusted by the KTA-2 tool adjuster.

32. Withdraw the tool bit to cut your final pass to the diameter required. Remember, this adjustment should be equal to half of the actual amount you require out of the bore. *Example: if your bore requires .020” more out of the bore to be cut to the finished diameter, adjust your tool bit .010”*

33. Once cutting bit has been adjusted the amount required, re-tighten the set screw that holds the bit in the bar.

34. With cutting bit set screw tight, remove the tool bit adjuster and begin your final cut. If you are using carbide tooling for your final cut, we recommend using Tap Magic cutting fluid in the bore for a fine, accurate finish. Many customers perform two final cuts using the optional carbide tooling. If you are using carbide tooling, you may wish to take a light cut at high RPM using tap magic for a very smooth finish.
Other types of setups and optional accessories explained:

In certain cases, such as bore repairs on parts where there is not access to both sides of the bore, the cones may need to be used on the same side as your boring bar and bar support bearings need to be mounted. In these cases, you may have to fabricate and attach a simple offset so that the cones will be able to be removed from under your machine and bar supports once they are mounted. Bore Repair Systems, Inc. offers a handy (3) piece kit, part number KBS-1 which includes (2) X-Y adjustable sub mounting plates and (1) bar support setup plug. Should you wish to fabricate your own X-Y adjustable sub mounting plate, a print of the plate is included in your users manual.

The part number KTA-2 tool bit adjuster kit and KMT-2 ID bore measure kits shown in this instructional booklet are optional items. The boring bar system may be used without these items, however these optional components are designed specifically for operator efficiency and accuracy with no bar removal or tool bit removal required to obtain ID measurements.

Our complete accessories kit # KBBC contains all of the most popular optional items for the EV and TM series boring bar system including the KTA-2, KMT-2, carbide tooling kits and the adjustable sub mounting brackets.

The following pages will show you how to set up your BOA-308i bore welder with your EV or TM boring bar package using the BW-300 bore welder interface kit.
The BW300 Bore welder to boring bar interface package

Components of package

Adjustable teardrop bore welder support
Adapter ring to mount teardrop on boring machine support
Setup / centering sleeve used with Adapter ring
Bore welder to boring bar rod alignment tool

Congratulations on your purchase of a new BOA bore repair boring and welding package. This system was designed to be easy to set up and operate, and is built to high quality standard ensuring years of trouble free service. Before continuing on with this bore welder to boring bar interface setup guide, please locate all the components shown above.

Borewelder to boring bar interface package setup instructions

STEP 1
After centering and mounting the boring bar bearing/s and machine support and pre-machining the bore, locate your Adjustable teardrop bore welder support and attach it to the machined outer ring on your boring bar bearing by tightening the clamping screw. Be sure to leave your boring bar in place. Note: if you are mounting your bore welder to the boring bar drive support bracket, you must install the adapter ring onto the Adjustable teardrop. You then un-clamp the boring bar drive and remove, and attach the Adjustable teardrop and adapter ring in place of the drive, in the drive

Tightening the clamp screw on the Adjustable teardrop bore welder support
STEP 2
Locate your BOA-308i bore welder mounting rod. This is the 1.25" diameter rod with the threaded end that is packed with your bore welder system. Screw the mount rod into the threaded receiver located on the Adjustable teardrop bore welder support and tighten with the tightening rod tool located in your bore welder tool kit.

STEP 3
Locate the Bore welder to boring bar rod alignment tool and slide it over both the boring bar and welder mounting rod. If the alignment tool does not slide easily down to the receiver and back easily, you will need to make adjustments. The mounting rod receiver block has two adjustments, one adjusts the center to center distances of the mount rod and boring bar (this distance is adjusted by loosening the bolt that retains the receiver block to the teardrop and then rotating the receiver block) the other is the mount rod perpendicularity adjustment. (adjusted by loosening the screw on the top side of the mount rod receiver block which allows you to pivot the mount rod and spherical insert)

Making the mount rod to boring bar center to center adjustment by loosening the receiver block retaining bolt and rotating the receiver block.

Making the bore welder mount rod perpendicularity adjustment by loosening the clamp screw. After this adjustment, notice alignment tool slides easily down to mount rod receiver block and back without binding.
STEP 4
With the bore welder mounting rod aligned, remove the boring bar and slide the BOA-308i bore welder onto the mounting rod. Take note of the axis that the bore welder will pivot on the mount rod. This slight pivot adjustment is the only adjustment left to ensure the bore welder is properly centered in the bore to be welded.

Tighten the nut located on the bore welder support as shown, once the welding gun is centered in the bore to be welded. 
*Hint, loosen the lower extension tube clamp screw so you may easily rotate the welding gun manually inside the bore. This speeds up the final centering process*

Bore welder gun is now centered and ready to weld the bore.

Contact our office if you have any further questions, or require further assistance on the set-up or operation of your BOA bore repair package.