

Valve Body Reaming Fixture

Part No. **VB-FIX**

- Base Plate Standard
- Clamp Mounting Plate Round
- Clamp Plate
- Outer Races (2)
- Inner Race
- Studs (3) Threaded
- Washers (3) Flat
- Wing Nuts (3)
- Socket Cap Screws (4)

Patent Nos. 7,220,085 & 7,771,144

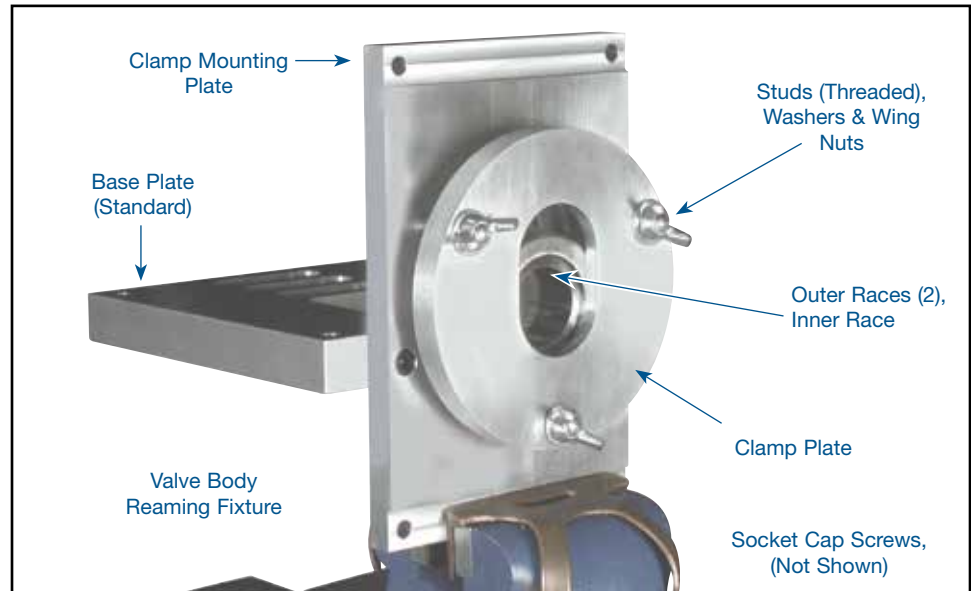
NOTE: Special tool kits have been designed to service a specific valve train bore and must be used in conjunction with the valve body reaming fixture. Part numbers for these specially designed kits begin with an F-, to distinguish them from traditional Sonnax tool kits that can be used as standalone tools.

Also Available:

Oversized Pump Base Plate

Part No. **VB-06**

Multiple Applications



1. Assembly Instruction

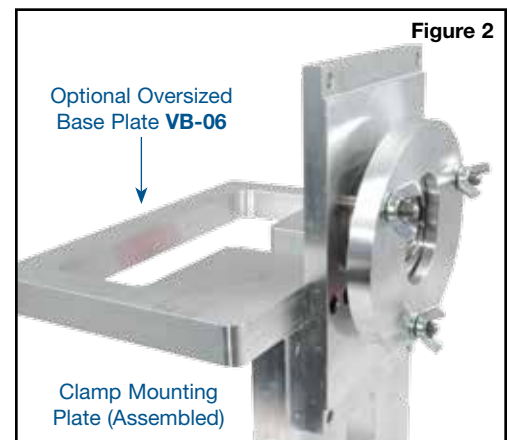
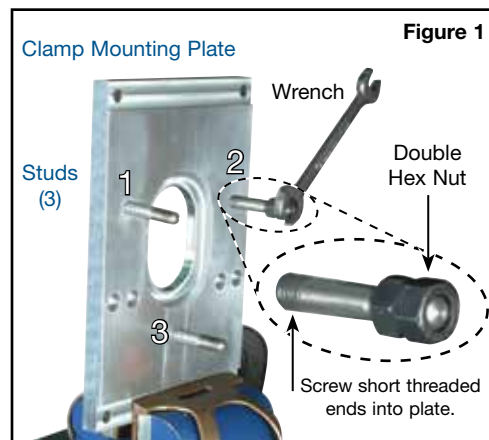
- a. Remove all parts from shipping container.
- b. Install three Sonnax threaded studs into Sonnax clamp mounting plate (**Figure 1**).



NOTE: Shorter thread-end of Sonnax studs must be threaded into the front plate. The shorter thread is an interference fit so it will thread in harder than a normal bolt.

NOTE: Using a double hex nut on the long threaded portion of Sonnax stud helps thread the stud into the plate. Studs can be locked in place by using Loctite™ 609.

- c. Use four Sonnax socket cap screws (not shown) to attach Sonnax standard base plate (**main photo**) or Sonnax optional oversized base plate **VB-06** (**Figure 2**). Align the front clamp mounting plate square to either base plate.
- d. Coat the two outer races as well as the inner race with lightweight grease.



1. Assembly Instruction (continued)

- e. Install two Sonnax outer races and Sonnax inner race into the pocket in Sonnax clamp plate forming a ball and socket (**Figure 3**).
- f. Install Sonnax round clamp plate over the installed three threaded studs (**Figure 4**).



NOTE: Orientation of the pocket must face the pocket in the front plate.

- g. Install three Sonnax flat washers over threaded studs.
- h. Install three Sonnax wing nuts over threaded studs and tighten to “finger-tight”.

2. Basic VB-FIX Procedures

- a. Mount the fixture in a vise (**Figure 4**). Test fit the guide pin in the bore. Make sure pin slides in and out freely. If pin does not slide smoothly, clean guide pin and valve/pump body bore, lubricate pin with cutting fluid and recheck fit.
- b. Put valve/pump body on base of reaming fixture, open circuits facing up whenever possible (**Figure 5 & 6**). Due to valve/pump body variations, it may be necessary to clamp with the circuits down. In this case, position the bore to be reamed over the cutout in the plate in order to provide a source of lubrication and removal of chips. Once the valve/pump body has been secured following steps 1-6, the complete fixture can then be removed from the vise and rotated 180° for better access to the circuits through the cutout in the plate.
- c. Install reamer jig into inner race of reaming fixture (**Figure 7**).
- d. Install guide pin through the reamer jig (**Figure 8**).

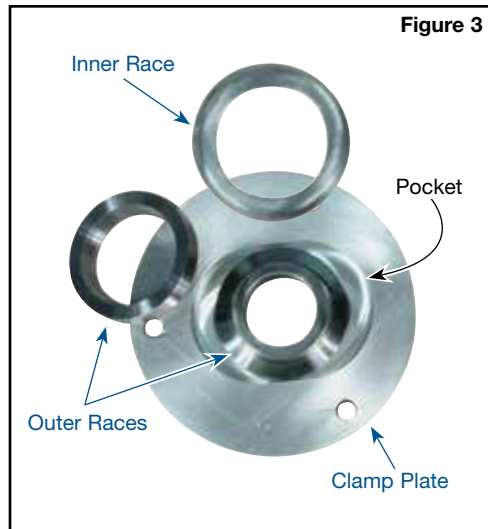


Figure 3

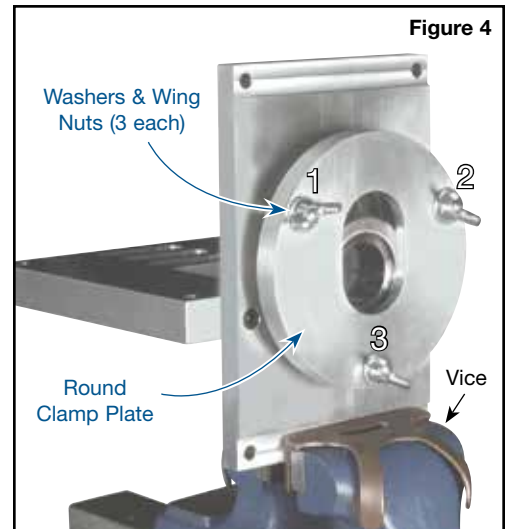


Figure 4

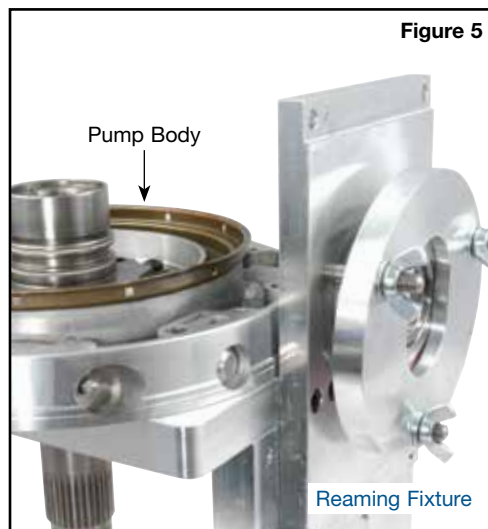


Figure 5

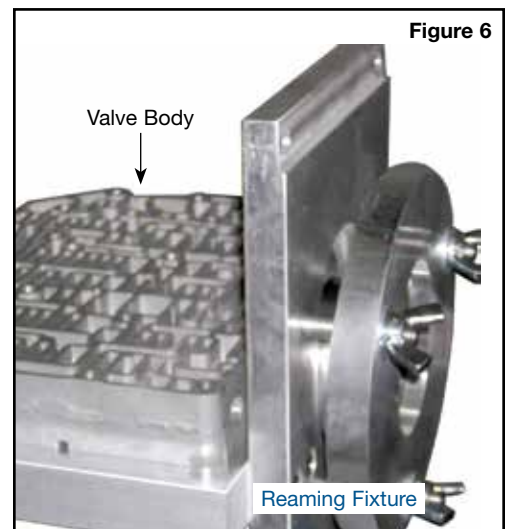


Figure 6



Figure 7

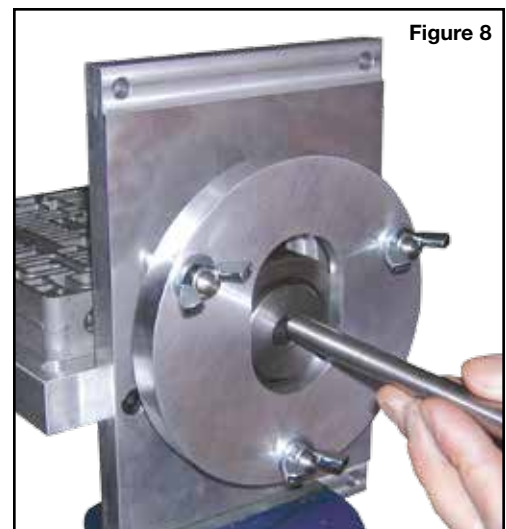



Figure 8

2. Basic VB-FIX Procedures (continued)

- e. Align valve/pump body so guide pin fits fully into the valve bore; leave wing nuts on fixture loose (Figure 9).
- f. Using a “C” clamp, clamp valve/pump body securely to fixture base (Figure 10). It is recommended to use only one clamp, as two clamps may distort valve/pump body. Position valve/pump body close to reamer guide. Do not clamp over the bore being repaired.
- g. Check fit of guide pin. The pin should slide smoothly with no binding.
- h. Lightly tighten all three wing nuts continuously, then recheck pin fit while sequentially snug-ging down the wing nuts by hand. Wiggling the pilot may also be necessary during this process to keep the guide pin moving freely. Do not use pliers or tools to tighten wing nuts. Do not overtighten one wing nut as this will pull the fixture out of alignment.
- i. Recheck to see if guide pin slides smoothly in bore. If pin does not slide freely, loosen wing nuts and readjust.
- j. Remove guide pin and install the reamer (Figure 11).
- k. The guide nub on the large reamer cutting diameter should fit into the first valve/pump body land to be cut (Figure 12 & 13).
- l. Ream valve/pump body using standard procedure (Figure 14).

 **NOTE:** These are general guidelines for using the VB-FIX. Check for specific instructions packaged with each F-Series tool kit.

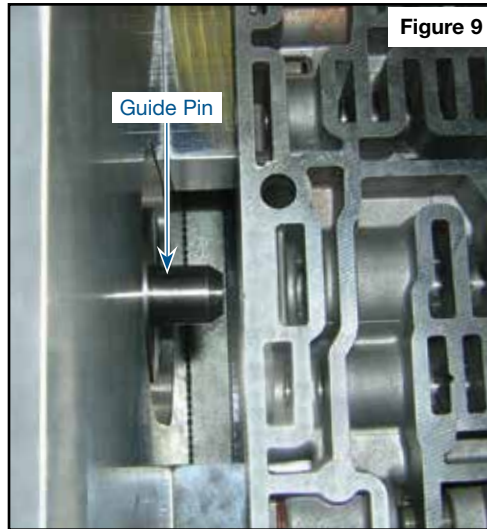


Figure 9

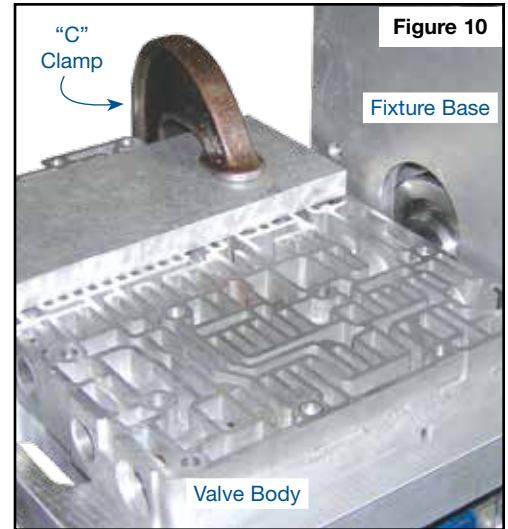


Figure 10

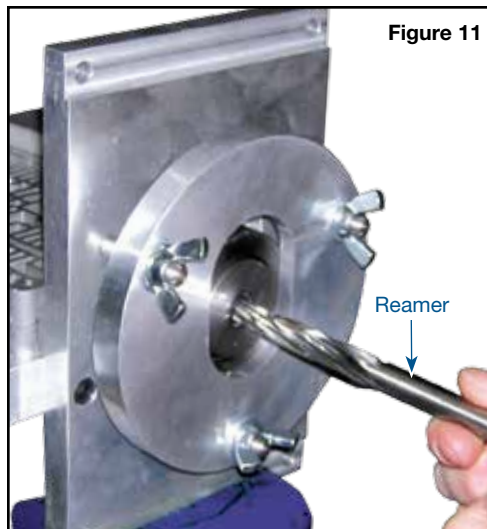


Figure 11

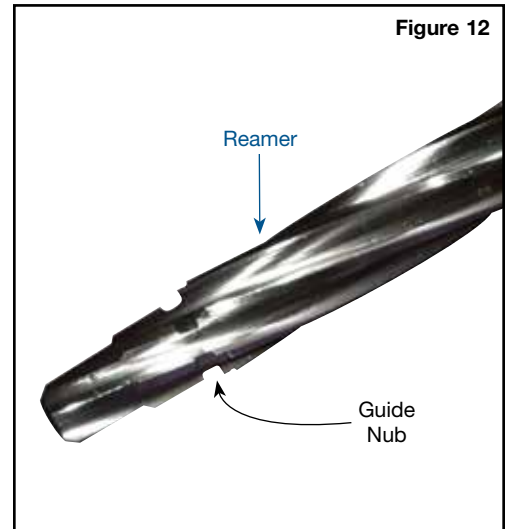


Figure 12

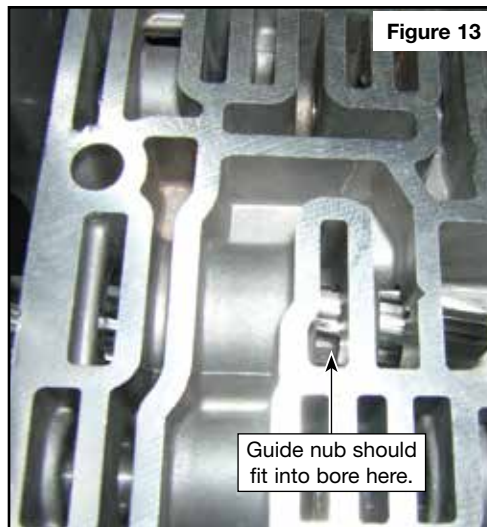
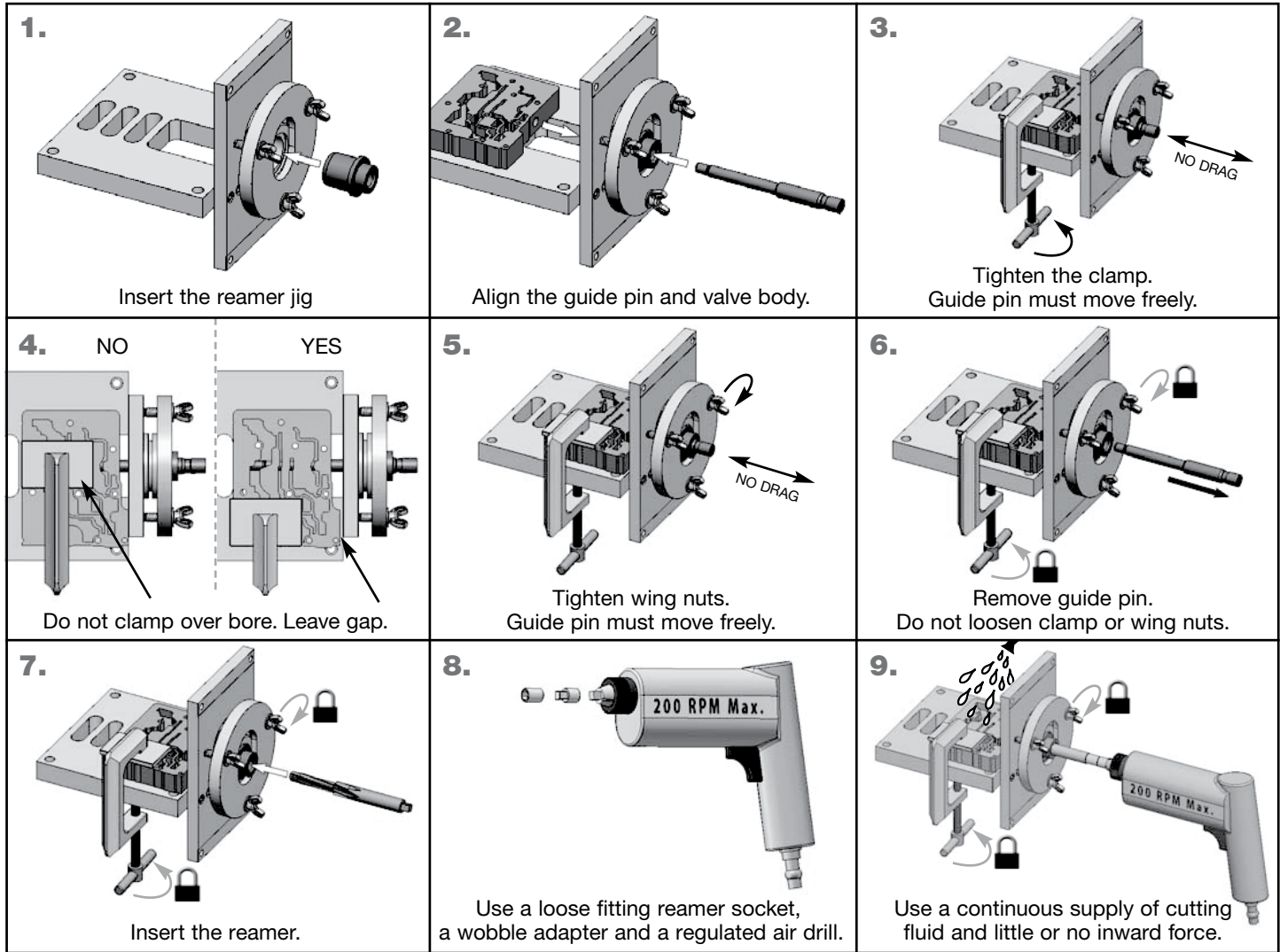


Figure 13

VB-FIX Reaming Instructions

Figure 14



Important Notes

- Clean the bore thoroughly in a solvent tank.
- Generously lubricate the bore and reamer with cutting fluid (i.e. Mobilmet S-122, Lubegard Bio-Tap, Tap Magic™, etc.). For best results, provide a continuous flow of water-soluble cutting fluid (i.e. Mobilmet S-122) during the reaming process.
- The reamer should be turned using a low RPM, high torque air drill regulated to a maximum of 200 RPM.
- Examine the bore after cleaning for surface finish, debris, and burrs. Flashing and burrs on the exit side of lands and bores must be carefully removed. A small piece of Scotch-Brite® material attached to a wire and powered with a drill motor is ideal for the task.