

## Oversized Pressure Regulator Valve



**Part No.**  
**77917-06**

## Tool Kit

**Part No.**  
**77917-TLC**

- Reamer Carbide
- Drill Jig

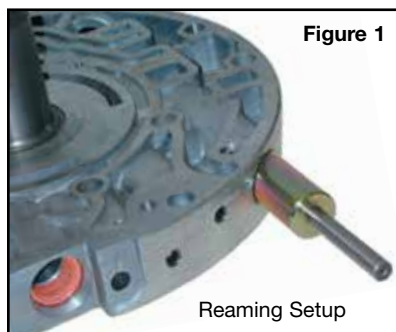
**CAUTION:** Casting hardness often causes adverse issues with reamer performance in the 4L60/E pump. For consistent bore finish quality and extended reamer life, Sonnax recommends using carbide tool kit **77917-TLC**. This tool kit can also be used with Sonnax oversized pressure regulator valve **77917-07**.

## Tool Kit

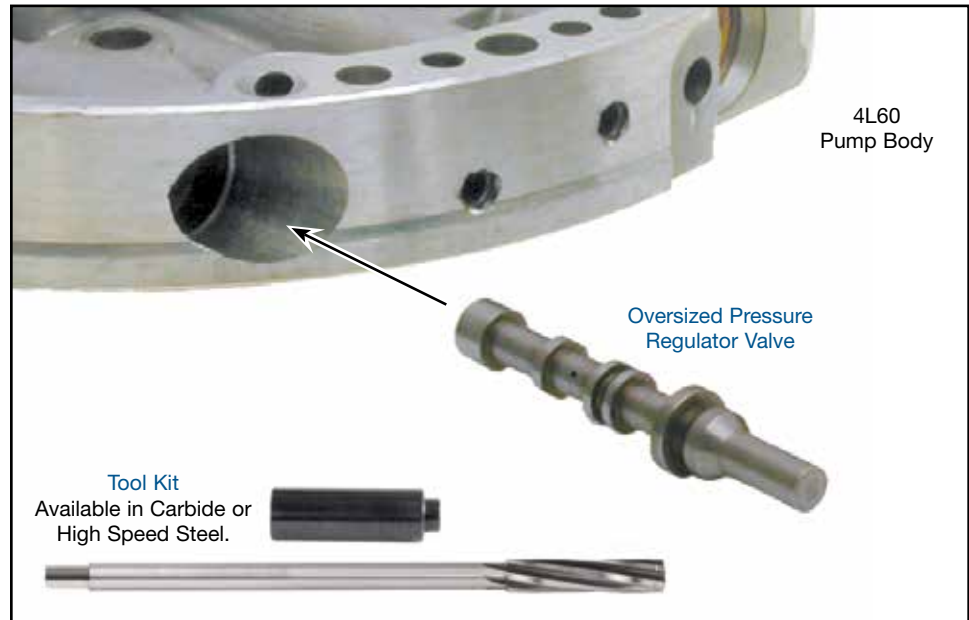
**Part No.**  
**77917-TL**

- Reamer High Speed Steel
- Drill Jig

**NOTE:** This tool kit also can be used with oversized pressure regulator valve **77917-07**.



## GM 200-R4, 4L60



### 1. Disassembly

- Remove and discard OE pressure regulator valve.

### 2. Bore & Reaming Preparation

- Clean bore thoroughly in solvent tank.
- Securely clamp housing to bench or vise, making sure not to clamp directly over bore to be reamed.

### 3. Reaming



#### CAUTIONS & SUGGESTIONS:

- Reaming action must be clockwise in a smooth and continuous motion.
- Turning reamer backward will dull it prematurely.
- Pushing on reamer results in poor surface finish and inadequate and sporadic material removal.
- Never use a crescent wrench, ratchet or pliers to turn reamer.
- A dull reamer will cut a smaller hole. Reamers can be sharpened, but this should only be done by a professional tool sharpener. Actual life of a Sonnax high speed steel reamer before resharpening or replacing averages 50-70 bores.

### 3. Reaming (continued)

- Generously lube reamer shank and jig bore. Insert reamer, square shank first, into snout end of jig. Slide jig along shank until jig snout stops against reamer body (**Figure 1**).
- Generously lubricate bore, jig and reamer with cutting fluid (i.e. Mobilmet S-122, Lubegard<sup>®</sup> Bio-Tap, etc.). For best results, provide continuous flow of water-soluble cutting fluid (i.e. Mobilmet S-122) during reaming process.
- Gently insert reamer and jig into the bore until cutting tip contacts first bore to be reamed (**Figure 1**).
- Turn reamer clockwise with a low-RPM, high-torque drill regulated to a maximum of 200 RPM. Use a smooth and continuous motion at a consistent speed between 60-200 RPM. Continue reaming until reamer stop is reached.

### 4. Finish & Clean Up

- Using low air pressure, blow chips free before removing reamer.
- To remove reamer, turn clockwise while slowly pulling outward on reamer.

### 4. Finish & Clean Up (continued)

- c. Examine bore after cleaning for surface finish, debris and burrs. Flashing and burrs on exit side of land and in 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. Scotch-Brite™ is a very abrasive material and all residual debris must be cleaned to ensure particles do not migrate or remain imbedded into the surface. Post cleaning involves several progressive steps with solvent on a lint-free rag.
- d. Clean reamer after each use and store in its protective tube.

### 5. Installation & Assembly

- a. Ensure all debris has been removed from valve bore and valve body.
- b. Lubricate and install Sonnax valve and remaining OE parts.

### 6. Final Testing (Figure 3)

Vacuum testing at the port(s) indicated holds the recommended minimum 18 in-Hg.

### 7. Replace the Boost Valve(s) to Compensate for Larger Pressure Regulator Valve

Boost valves should be checked for leakage at the same time the pressure regulator valve is being replaced. Any boost valve leakage will reduce the effectiveness against the oversized pressure regulator valve. When oversizing the pressure regulator valve, it is recommended to move up one boost ratio.

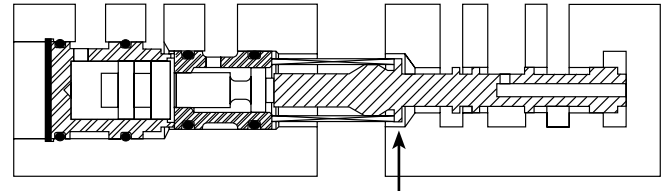
### Bonus Tech Tips

In addition to installing the Sonnax pressure regulator valve, the following areas should be addressed to ensure that the unit will not continue to have problems due to other sources. Check the following areas of the pump carefully.

- Add a second pump slide spring if there is only one. The slide spring acts against decrease pressure to control the output of the pump.
- Replace the pump slide pivot pin if it is worn. A worn pin will reduce pump output.
- Replace the slide wiper seal if it is loose (the seal is located opposite the pivot pin).
- Inspect the clearance from the top of the pump slide and rotor to the surface plane of the pump cover. Before measuring, remove the O-ring that is in the groove on the underside of the pump slide.
- Put a straight edge across the pump cover and use feeler gauges to measure the clearance with the slide and rotor. The clearance should not exceed .0025". If the clearance exceeds .0025" the rotor/slide pocket is worn. The pocket must be machined flat and the pump cover resurfaced to achieve the proper pocket depth.
- Inspect the surface finish of the pump housing and cover. There cannot be any phonograph type grooves on the surface. When resurfacing pumps it is important to use a slow feed rate, a high surface speed, and a diamond cutting bit. Carbide cutting bits often leave the surface finish too rough.

4L60 Boost Valve Requirements

Figure 2



Spring seat on Sonnax valve compensates for larger diameter. OE spring results in same line at idle.

4L60-E Boost Valve Requirements

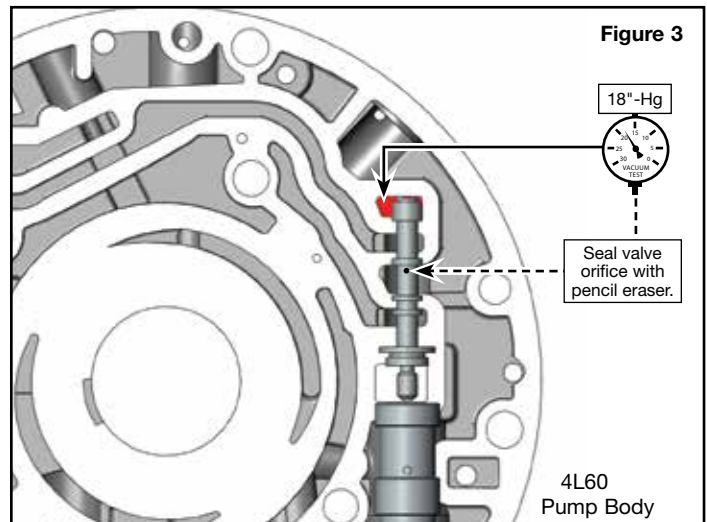
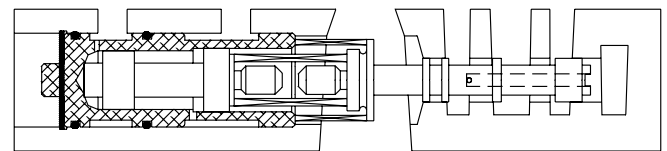


Figure 3

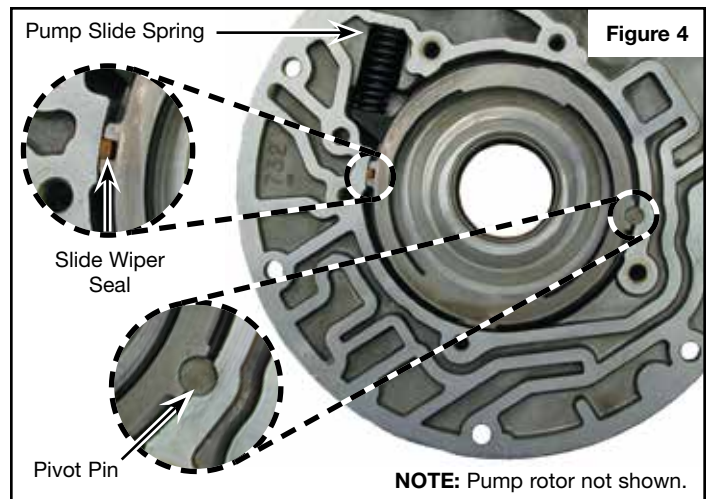


Figure 4