As with any transmission that has one or two bands, it's important during any major internal service to make sure the servos that apply these bands have the proper travel. Not only does this help assure long band life, but in most cases this travel also determines how a particular shift will feel.

The Ford CD4E transaxle, used in many small Fords and Mazdas, is no exception. Ford has a special tool that works quite well for measuring this all-important servo travel. If you already have one, use it on every CD4E you rebuild. But if you don’t have the Ford tool, here's a simple, free alternative you can build from parts you’ll be discarding from your next CD4E job (figure 1), which will allow you to measure the CD4E servo travel accurately.

Building Your Servo Tool

Start with an old CD4E servo cover, or the cover that came with the job you’re working on now. Since you really must replace this cover every time you rebuild one of these units, you won’t be using the old cover for reassembly, so you might as well use it to make your servo travel tool.

Use a razor blade (carefully!) and wire wheel to remove the vulcanized rubber seal from the edge of the cover (figure 2). Make sure you remove any burrs, or rough or sharp edges on the cover that could scratch or gouge the servo bore while you’re using this tool.

You’ll be drilling and tapping this cover to install a bolt through it (figure 3). I use an old THM350 pump bolt, 5/16” x 18 TPI with a 9/16” head, but you can use any similar-size bolt as long as you have a tap that’s the right thread. Make sure you choose a straight bolt for this adjustment tool.

Drill the cover as straight as you can with the appropriate drill for the tap. The cover isn’t very thick, so you might want to use a drill that’s 1/64” smaller than the recommended size. You’ll have to push and fight the tap a little before it’ll begin cut-
ting, but you’ll get the longest threads possible, giving the cover a good grip on the bolt threads.

Once your tool has the proper threaded hole in the center, drill another 1/4” hole through the cover, right where the rounded crown of the cover meets the flat part (figure 4). Thread the adjustment bolt into the center of the cover, and your new tool is ready to go.

**Using Your Servo Travel Tool**

1. Coat the servo bore with assembly lube.
2. Install the servo return spring and the new servo piston into the servo bore (figure 5).
3. If the adjustment bolt is threaded through the cover far enough to touch the piston it’ll make installing the snap ring more difficult, so either temporarily remove the bolt, or make sure it’s only threaded into the cover one or two threads.
4. Install the tool in the servo bore on top of the servo piston, and lock it in place with the servo cover snap ring (figure 6).

5. Thread the adjustment bolt into the tool until it just contacts the servo piston.
   • If you’re going to measure servo travel with a caliper, place the depth measuring pin through the hole in the tool until it contacts the servo piston, then zero the display or dial on your caliper (figure 7).
   • If you’re using a depth micrometer, measure the
distance from the top of the tool to the top of the servo piston through the hole in the tool; we’ll call this Measurement A.

6. Tighten the adjustment bolt to 36 in/lbs (figure 8), which will compress the servo toward the applied position.

7. Measure the distance to the top of the servo piston through the hole in the tool, just as you did before.
   • If you’re using a caliper, the measurement will indicate the servo travel (figure 9).
If you're using a depth micrometer, we'll call this Measurement B; it will be greater than Measurement A. Subtract Measurement A from Measurement B to determine servo travel.

The servo travel specification is from 0.094" to 0.193". But try not to go much over 0.170". If your measurement is outside the acceptable range, the servo piston pin or the piston-and-pin assembly comes in several lengths for adjusting servo travel. You can identify the different length servo pins or piston assemblies by the rings near the tip of the pin (figure 10).

- If there's too much servo travel, use a longer pin.
- If there's too little servo travel, use a shorter pin.

Selective Servo Apply Pins
There have been changes to the piston-and-pin design. Your servo may or may not have a replaceable pin held in by an e-clip (figure 11). But even though the overall length of the pin is different between these two styles, the distance from the piston to the apply end of the pin is the same (when comparing piston/pin types with the same groove count). So the difference in length doesn't affect the measuring process or how to decide which length pin or piston-and-pin assembly to use (figure 12).
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Ford CD4E Servo Travel Tool

There are three lengths available in either style, though you may not be able to find new early-style pins (the kind held in place by e-clips). You’ll probably have to go with used ones if you want to retain that piston-and-pin style.

The shortest pin or piston-and-pin assembly has two grooves near the tip. The next longer one has one groove, and the longest one has no grooves near the tip.

Keep in mind that the two styles of piston aren’t interchangeable by themselves. There are other differences which are still subject to change, such as return spring tension and whether there’s a cushion spring or not, so consult your parts manual or supplier for complete interchange or update information.

**Finishing Up…**

Remove the servo travel tool and install a new servo cover. Never reuse the old one; this is the only seal keeping servo oil in the servo bore rather than squirting out onto the ground. Why gamble with such a relatively cheap part?

**Note:** If you’re working on an earlier unit, it may have come in with a sheet metal dust shield over the actual servo cover (figure 13). You don’t need to reinstall this thin dust shield. Even the factory quit installing them on later units.
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