

6 Assemble Synchro Gears and Parts

Important!



! Start by placing the slider within the hub and make sure the slider's notches line up with the key slots. Some sliders have notches on all the splines; others have them in just in three places. It's a good idea to use a felt-tip marker to indicate where the notches are. If the notches are not lined up correctly with the synchro strut key slots in the hub, the synchro will not work.



Place all of the struts or dogs in their hub slots.



When using a hollow key, the spring tang usually is placed in the center of the key. Otherwise, it is alongside it. Insert the spring in a clockwise direction.



Flip the synchro assembly over and install the second spring in a clockwise direction. When assembled, the springs will be opposite of one another and create a nice balance.



This completed assembly shows solid-design strut keys. I usually grind the spring tangs, so they don't hit the inside wall of the hub. This helps to provide a clean, positive shift.

When loading the needles you can only load as many as will fit. There is no need to count. If you can fit one more needle, then you need that extra needle. Once I have all of my needles loaded, I take the counter-shaft I'm going to use and push it through the gear. I hold a thrust washer on the opposite end of the gear to keep all the needles from getting pushed out, and then I push the shaft through. This adds some extra packing and squeezes out extra grease. I rotate the shaft in the gear because this allows me to check for binding and smooth rotation. Next, I then remove the shaft, which allows me to inspect the needles and check for complete rows, good alignment, and proper spacing. A dummy shaft cannot be used for any of these checks because the gear has been installed in the case after the shaft is removed.

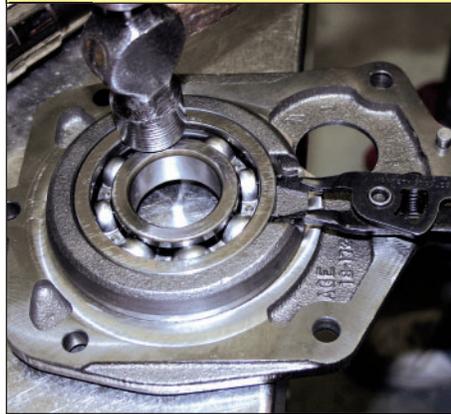
Subassemblies and Synchronizers

Some of the basic assembly techniques pictured in this section are used in just about every build listed in this book. Rather than repeat these steps with each build, they are shown here only.

The synchro slider can exhibit wear on the teeth, but can also have an enlarged groove for the shift fork. Common causes for falling out of gear are worn engagement teeth on the slider and gear combined with a worn shift-fork groove and worn shift fork.

Strut keys or shift dogs always give people assembly problems because they are spring loaded. Rather than assemble in this order: springs, keys, and slider, which is how most shop manuals tell you how to do it, simply place the slider

7 Remove Bearing



If the bearing locates from the outside diameter, press or tap it in place from the outside of the case.



If the bearing locates from the inside diameter, press or tap it in place from the inside race. Its best to use a press, but a punch will work if the fit is a slip or snug fit.

Precision Measurement

8 Check Snap-Ring Clearance



Q *It's simple to check snap-ring clearance. First, verify that the edge of the ring fits the groove before installing it. Then use a micrometer to measure the width of the groove and thickness of the ring. Dialing-in the correct endplay is a matter of subtracting the width of the groove from the thickness of the ring.*

on the hub first, then the keys and then the springs.

This is a modular approach of fitting synchro rings to the gears and creating component subassemblies aids in building a quality transmission. They offer the rebuilder a simple way to perform quality checks. If you have more than one person working in a shop, it is a good idea to have your subassemblies inspected by

someone else and vice-versa. Sometimes another set of eyes is all that is needed to prevent a potential disaster.

Bearing Tips

Misdiagnosing bearing noise usually leads to a worthless rebuild. The majority of people cannot distinguish between bearing noise and gear noise. Once bearings develop