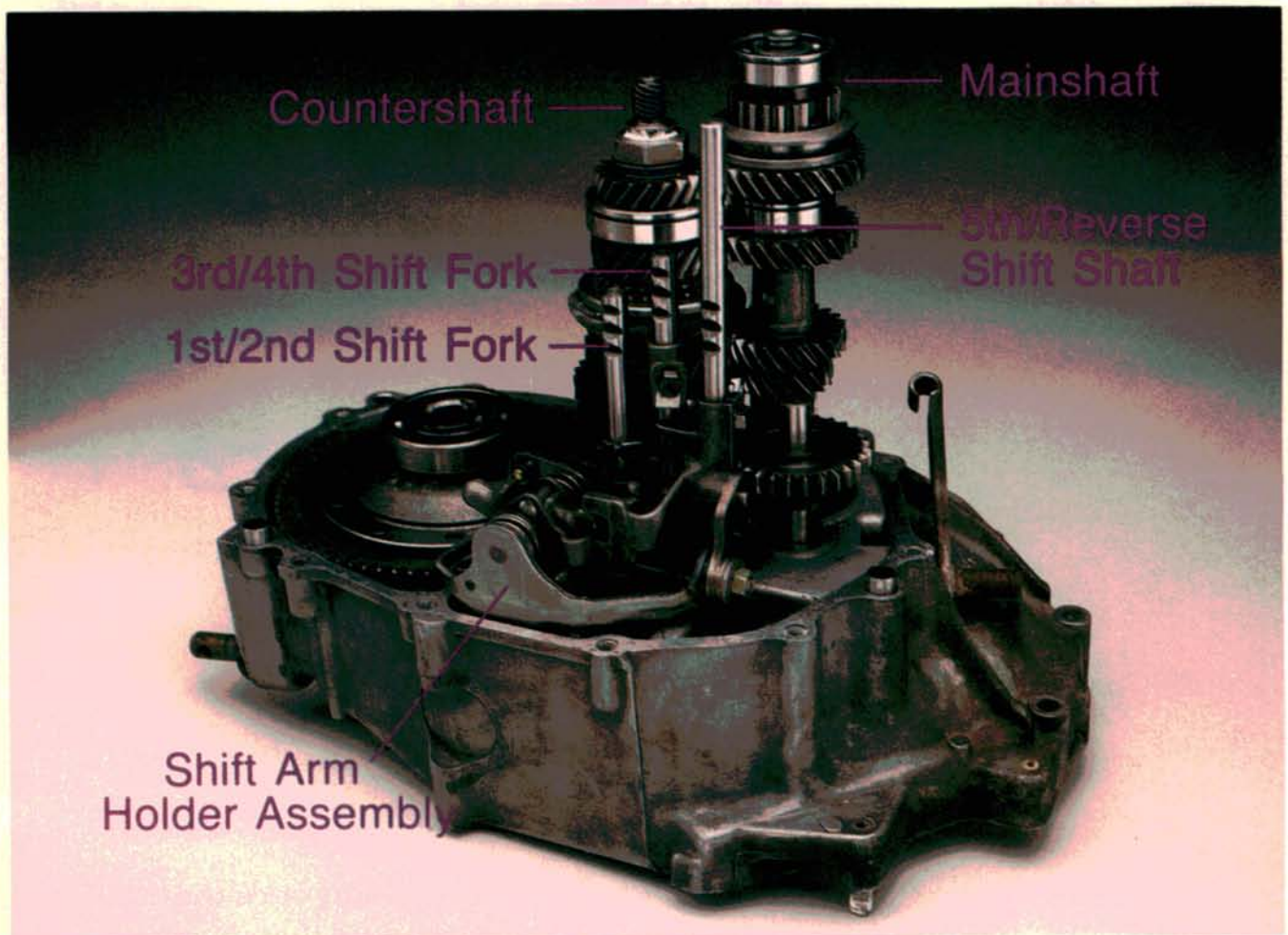


Honda Transaxle Repair

PART TWO



As promised, we'd like to continue with the second part of our Honda Civic transaxle repair. We sure hope the customer hasn't been waiting.

This month we'll look at some highlights of mainshaft clearance measurement and adjustment, synchronizer inspection and measurement, shift arm holder disassembly, differential checks, and reassembly.

Since we're covering a number of areas, we'll bounce around a bit from subject to subject, so be aware that we may change lanes without a turn signal. Instead of doing a blow by blow, we're concentrating on some key points that might foul you up. As a result, reassembly procedures not specifically noted are simply the reverse of the original teardown.

Here are some tips and hints:

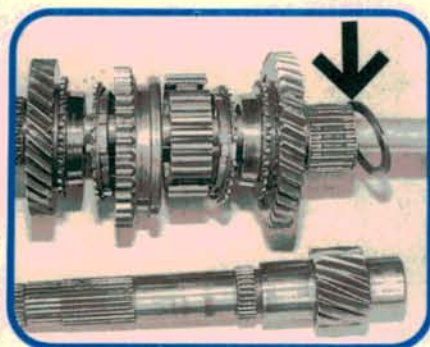
- You don't have a backlash adjustment to worry about between the pinion and countershaft, because there is none.
- Side gear clearances in the differential can be checked with a dial indicator as you would on most other differentials. Excessive backlash between the pinion and side gears can be corrected (to a point) by installing new thrust shims to compensate for wear.
- If you do have to remove the ring gear from the carrier for any reason, you'd better know that the bolt threads are LEFT-HANDED. So don't just set the old impact for right-hand-thread-unscrew and turn up the air.
- When reassembling the transaxle, make sure you have cleaned the mating faces of the case halves without scoring or gouging them. Also make sure you have a new OE or OE equivalent gasket. Don't just

silicone the case halves. Changing the gap between the case halves could alter side bearing clearances. Torque the case bolts in the proper sequence, to the proper torque of 27 Nm (20 ft-lb).

- Lightly lube all parts as you reassemble the trans. Use motor oil.
- Check individual gear engagement as you go along. Make sure all detents and springs are properly installed, and check their action.
- Note the relative position of the four bolts that hold the shifter arm assembly to the case. Two of them are 6 mm standard bolts. Two are 6 mm flange-style bolts. Don't damage the case threads by overtightening the wrong bolts in the wrong holes. All four torque to 12 Nm (9 ft-lb).

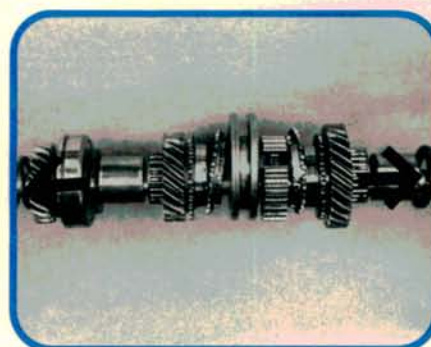
And now, back to the movie.

—By Ralph Birnbaum



1

As a quick refresher, we made shish kebabs out of the countershaft components. This may help you remember the proper reassembly sequence in case you forgot. The shim marked by the black arrow at the right is the one we measured in photo 17 last month and determines first gear end play.



2

We couldn't fit the entire stack in one photo. Here's the rest of the countershaft stack. The spacer below the arrow at the right was the one we measured in step 18 last month and separates 2nd and 3rd gears. The domed side of the convex washer below the left arrow faces toward the nut.



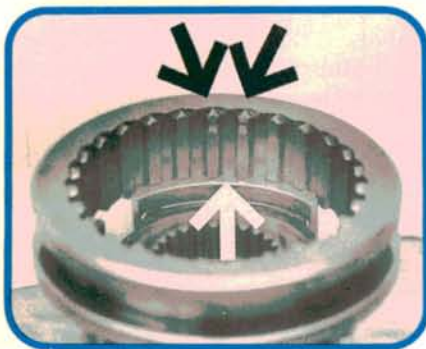
3

We have a clearance measurement to make on the mainshaft. With the mainshaft fully assembled, including the snap ring, check between the spacer and 5th gear. Original specification is 0.05-0.38 mm (0.002-0.015 in). If out of specs, correct the clearance with a different thickness thrust washer.



4

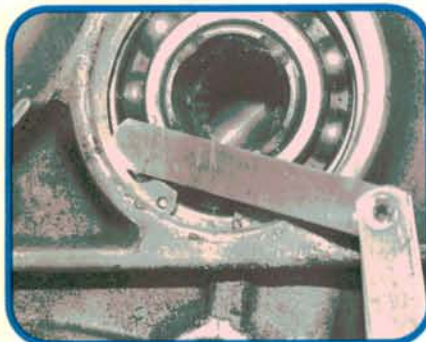
Install the synchro on the coned face of the matching gear and turn it slightly until the braking action of the synchro stops it. Check the synchro-to-gear clearance. The specification for new parts on all the synchros is 0.85-1.1 mm (0.033-0.043 in). The wear limit is 0.4 mm (0.016 in).

**5**

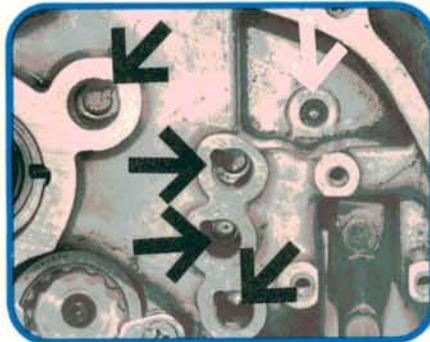
When reassembling the synchro sleeves and hubs, note that they have to be lined up in a specific way, or they won't go back together. The teeth below the black arrows index the sleeve on the hub. Center them between the synchro locator windows so they fit the deeper matching grooves in the hub.

**6**

Here's a very simple, but very important adjustment. This snap ring determines the side clearance between the differential carrier bearings and the transaxle case. The rings are selective. If you replace any components that might change final bearing-to-case clearance, check and adjust as necessary.

**7**

To check side clearance, assemble the case halves with a new gasket and properly torque all the case half bolts. Now check to see if you can slip a feeler gauge thicker than 0.15 mm (0.006 in) between the bearing and snap ring. If so, you have too much play and will have to install a thicker shim.

**8**

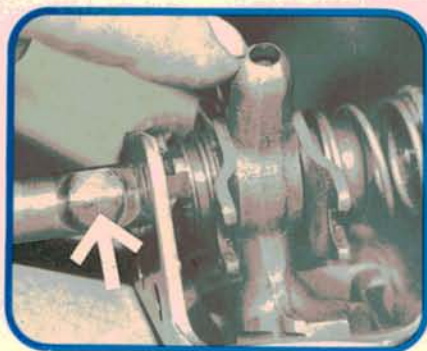
This photo has more arrows than Custer's hat. While we still have a bare case, let's check the shift rod bores (black arrows) for burrs or gouges that could cause hard shifting later. The white arrow points to the detent ball and spring for the reverse gear shift arm. Don't forget it.

**9**

The bearing for the countershaft sits in a blind bore and is held in place by this retainer plate. You'll need to free the screws with your impact driver because they're staked in place. After replacing the bearing, restake the screws and add a drop of thread locking compound for good measure.

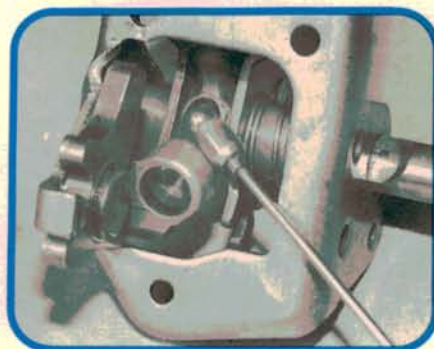
**10**

Did you have a problem with the spring return for reverse during your test drive? Then check the shift arm assembly. Unbolt it from the case, noting the position of the regular and shoulder bolts for reinstallation. Remove the retainer plate. Note how the plate indexes the shaft for proper position.



11

My fat finger points to the cavity for the detent ball and spring. Don't let the hole on this side fool you, there's nothing missing. The ball and spring enter from the other side. The arrow points to the notch where the ball rides. We already removed the retainer plate and started driving out the shaft.



12

Once you pull the shaft out far enough, the detent ball and spring will come out this hole at warp three, so be careful. To reinstall the shaft, you'll have to compress the ball and spring with a thin screwdriver while you tap the shaft back in place. Recheck detent action.



13

This photo better illustrates the position of the two regular and two flange style bolts that hold the shift arm holder in the case. Both are M6 x 1.0, so be careful. The black arrows mark the flange bolt positions, the white arrows point to the regular bolts. Torque to 12 Nm (9 ft-lb).



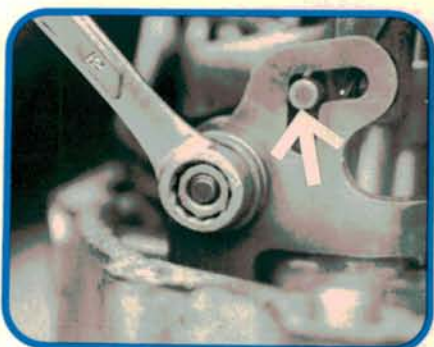
14

Before we reinstall the gear shafts in the case, put the reassembled countershaft in the soft-jawed vise (two blocks of wood worked nicely). Install a new nut. Torque the nut to 88 Nm (65 ft-lb). This socket is NOT deep enough (arrow), and could slip. Stake the nut without tearing the collar.



15

Reinstall the gear shafts and shift arm holder. Reinstall the shift rods and forks in reverse order of disassembly. When you reinstall the reverse shift arm, make sure the detent ball and spring are in place (white arrow). Align the rod (black arrow) with the L-shaped slot in the arm.



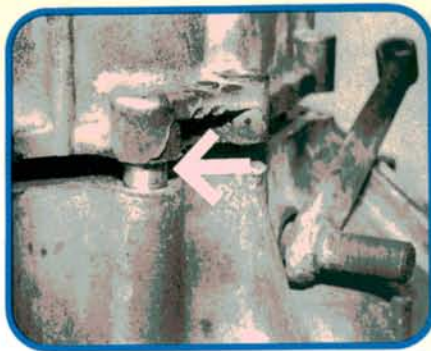
16

Don't forget that special washer that goes behind this nut on the reverse arm. If you forgot, we showed it in photo 11 of last month's article. Use a drop of thread lock on this nut and torque to 23 Nm (17 ft-lb). This photo shows the pin properly inserted in the L-shaped slot of the shift arm.



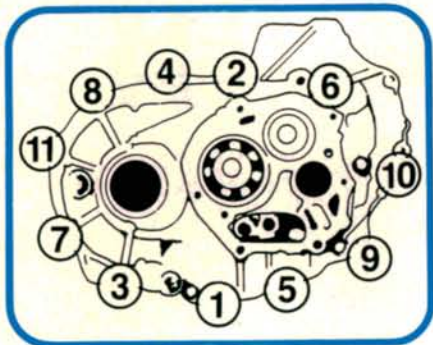
17

Now you can slide the reverse idler gear back in place. Make sure the grooved ring faces downward as shown and engages the reverse arm pin. With the gear in place, reinsert the gear shaft in the case. Recheck reverse arm alignment. Check for smooth shifting and detent action on the reverse arm.



18

Reinstall the case cover, aligning bearings, shift forks, and the case half locator dowels (arrow). Hopefully you've checked the dowels and mating holes for burrs or debris. Don't pound on things if the cover sticks. If everything is clean and properly aligned, there should be no problem.



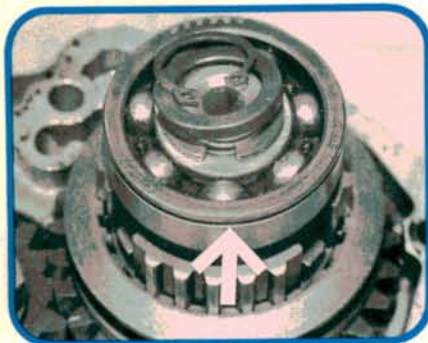
19

This illustration shows proper torque sequence for the case half bolts. Don't just start with one bolt and go in a circle, or you may cock the case and leave something in a bind. Gradually cross-tighten the bolts in the sequence shown to a final torque of 27 Nm (20 ft-lb).



20

Install the snap rings on the main and countershaft bearings. The rings snap into grooves on the bearing outer races. Then they are sandwiched between the upper case half and this housing spacer. Holding the bearings, holds the shafts. Forget the snap rings and you have problems.



21

Reassemble 5th gear and install the shift fork. Then reassemble the retainers on the countershaft bearing. The split washers fit into a groove on the countershaft. A domed spacer holds the segments in place beneath a snap ring. A large snap ring locates the bearing in the 5th gear housing.



22

The factory manual suggests installing the bearing in the case first, instead of installing it on the shaft and then sliding 5th gear housing over the bearing. We tried it both ways. Take your choice, but don't forget the large snap ring whatever you do. Never reuse—always replace—the inner snap ring.