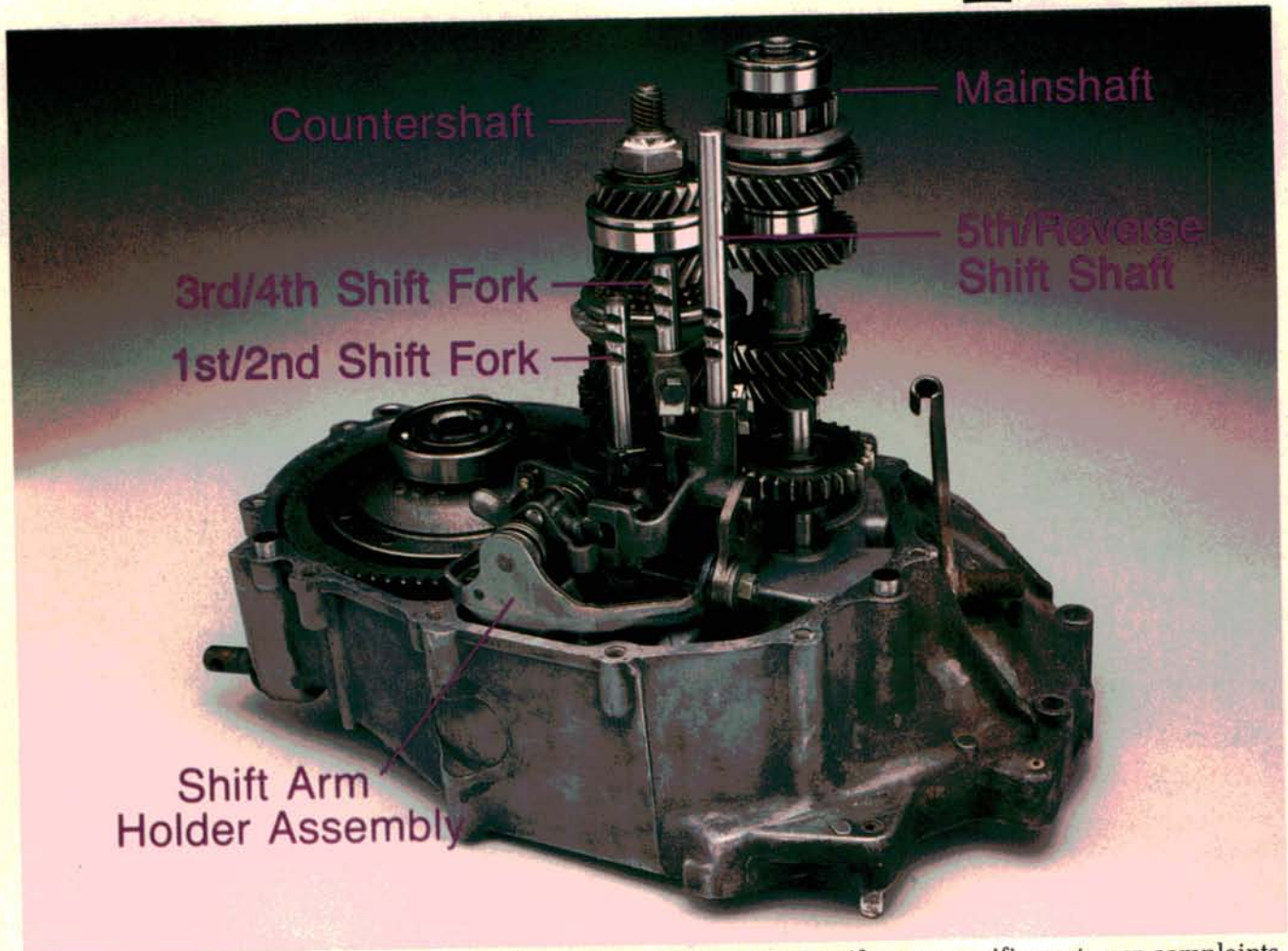




Honda Transaxle Repair



This month's knuckle buster tranny teardown covers a 5-speed transaxle from a Honda Civic. This particular transaxle type was used in Civics for 10 years, starting with the 1973 models. You'll be happy to know that you can disassemble, repair, and adjust this transaxle without a fortune in special tooling, or a Ph.D. in nuclear physics. It is a friendly, straightforward little unit.

As always, cleanliness, careful inspection, and attention to clearance specifications at key points will spell the difference between the success and failure of your repair.

Start with a test drive whenever possible. Listen for any abnormal noises. Look for difficulty shifting.

Be sure to verify any specific customer complaints. These points are simple, but essential to a complete diagnosis.

Hints and Hassles

Here are some things to keep in mind as the smell of oil fills the air:

- When you diagnose the cause of **hard shifting**, try to isolate the cause of the problem before teardown. Difficult shifter movement in all gears may be caused by nothing more serious than dry, binding bushings at the shifter. Also check to be sure the right oil was used at the last transmission oil change.

• **Harsh engagement in all gears** (as opposed to hard shifting) can be caused by anything that keeps the input shaft turning during shifts. So add a bad pilot bearing or bent input shaft to the normal list of possible clutch problems when you go hunting for your answers.

• **Harsh engagement of a specific gear** or gears is usually caused by worn, distorted, or cracked synchros. Worn engagement teeth and improper synchro braking action lead to clash and trash.

• **If a whining noise in 5th gear** is the original complaint, check for the proper oil level. Poor old 5th gear is the first guy to go without a drink when the oil gets low. Occasionally, correcting the oil level and stopping the oil leak that caused the original fluid loss, will cure things. Chances are the damage is already done, however, and further repairs will be necessary. Discuss the options with the customer. Also check to be sure the customer didn't inadvertently drain the trans instead of the engine when doing an engine oil change.

• Always replace the **axle retaining clips** before reinstalling the axles. Old, worn clips can cause you a lot of embarrassment when the combination of a hard turn and suspension bounce cause the axle and trans to go their separate ways. Simply spreading the old clip to tension it may also be a bad idea. Spreading the clips may do a dandy job of keeping the axles in place. Unfortunately, overspreading the clips may make it almost impossible to remove the axles for a related repair a year from now.

If you do run into a Civic that wants to lose its drive axles even after you've properly installed them with new clips, check to make sure someone else hasn't really run into it. Improper repairs after a collision may leave the drivetrain cocked in the vehicle, allowing the axles to pop out on turns.

Occasionally, a chassis damaged vehicle may allow

the axles to pop out just far enough to cause an oil leak at the side seals without actually launching the axle. In this case, the loss of oil kills the transaxle more slowly—but kills it just the same.

• Some Honda techs suggest that just taking **new synchros** from the package and dropping them in place may not be enough. Some actually take the time to apply a small amount of light lapping compound to the braking surface of the new synchro. Then they lap it lightly against the gear's tapered braking surface. Check for an even contact pattern with some bluing when you're done. If you try this, lap only enough to true the mating faces. Then check to be sure you still have the proper gear-to-synchro clearance. Thoroughly clean away all remaining compound.

• Make sure the clutch release bearing is not cocking or binding on the transmission snout where it rides. Severe wear on the snout can cause the bearing to wobble, catch, and grab on the snout. This can cause some strange clutch engagement problems.

• If you do find **excessive slop in the countershaft gear stack**, don't just keep tightening the end nut in an effort to correct it. It won't help a bit and you may damage the threads on the shaft and nut. Replacement of worn parts is the only real cure here.

• This transmission uses **engine oil**, not gear oil. The factory recommends 10W-30 or 10W-40 weight oil of an SE grade. Some Honda shops in warmer climates suggest they go as high as 20W-50 if it doesn't cause hard shifting. Do not use gear oil.

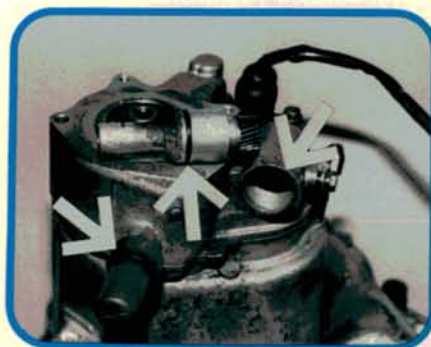
If everybody's ready, we can dive right in. We'll do this in two parts with the sequel coming in the November issue of *Import Service*. At that time, we'll look at mainshaft clearance measurements, synchronizer checks, shift arm holder disassembly, differential checks, and reassembly.

—By Ralph Birnbaum



1

After draining the oil, remove the end cover. This ball bearing supports the mainshaft in the 5th gear housing. The oil barrier plate at the left is indexed in the cover by a small tab. Remove it and make sure its oil passages aren't clogged. We suggest replacement of all three o-rings.

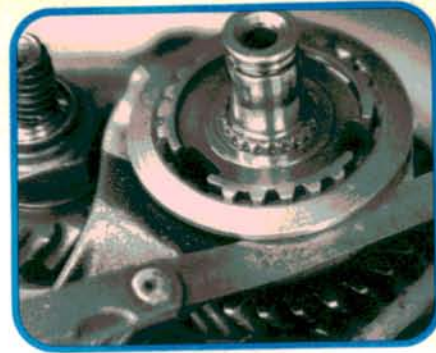


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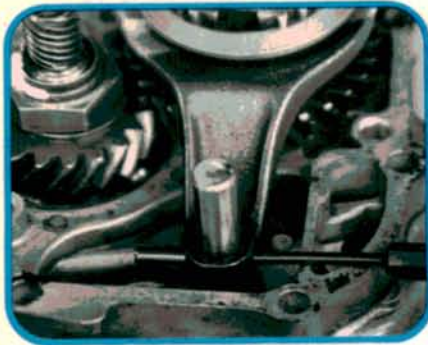
Now remove the large snap ring that goes around the bearing to locate it in the housing. Remove the speedo drive gear and inspect it for damage. Tap the 5th gear housing with a soft mallet to loosen it and remove it. Also check the rubber breather cap to be sure it's not plugged.

**3**

This photo shows the stack sequence for the 5th gear parts on the mainshaft. Remove the small snap ring on the shaft (always replace), the retainer collar and the split retainer ring below it. Then you can pull the bearing and spacer collar that rides between the bearing and the synchro hub.

**4**

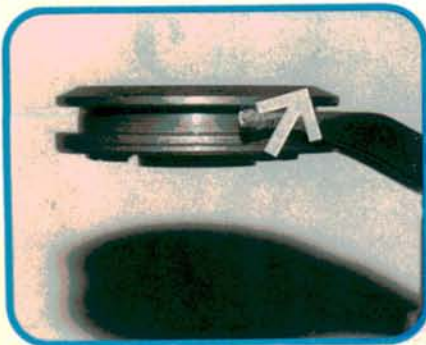
Check the clearance between the 5th gear shift fork and the synchronizer sleeve. Fork-to-sleeve clearance specifications for all the forks are 0.5-0.7 mm (0.02-0.04 in) for new parts. The wear limit for used parts is 1.0 mm (0.04 in). Also check to see that the fork hasn't been bent.

**5**

Shift the fifth gear fork up high enough so you can remove the roll pin with a suitable punch. Make sure you have a punch big enough to catch the head of the pin without jamming or binding in the shift rod. Remove the fifth gear fork and gears together and lay them aside as an assembly.

**6**

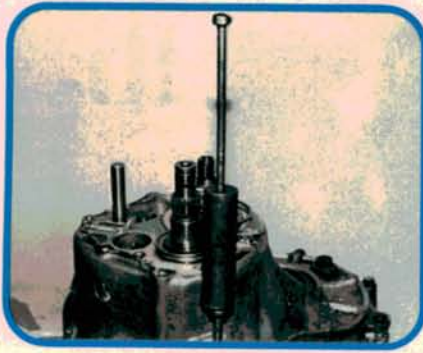
If you disassemble 5th gear to inspect it, don't forget that the synchronizer hub has a top and bottom. The shoulder on the synchronizer hub faces toward 5th gear. See the synchronizer spring? Even if synchro clearances are correct, replacement of the springs is good insurance.

**7**

If the measured clearance between the shift fork and synchro sleeve was greater than 1.0 mm, mic the fingers on the fork. The fingers on the 5th gear fork should be 5.4 mm (0.21 in) when new. Wear limit is 5.0 mm (0.20 in). Also note that the domed face of the synchro sleeve faces upward.

**8**

With fifth gear removed you can remove the spacer housing. Remove the two large snap rings on the main and countershaft bearings, the detents, and the 11 bolts holding the case halves together. You don't have to remove the nut and countershaft 5th gear just yet.



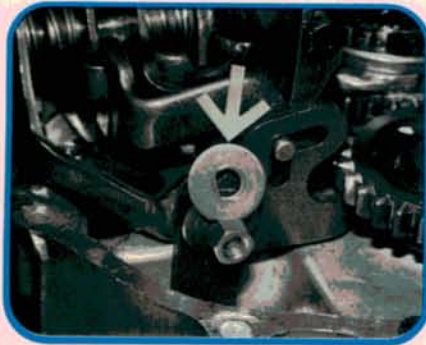
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Don't start driving wedges between the case halves to separate them. Thread a slide hammer into the threaded boss on the case. We don't want the mating surfaces of the case damaged or distorted. There are two small bosses on the upper case. If you tap on them to help the slide hammer, do it gently.



10

With the case split, carefully clean away the gasket, making sure you don't gouge the mating surfaces. Inside the case, start disassembly by removing the reverse idler shaft. Lift the shaft until it clears the case and slide the reverse idler gear and shaft out of the reverse shift fork.



11

Remove the retaining nut on the reverse shaft and the special washer below it. The washer has a locator flat to keep it from turning on the shaft. Be careful not to lose it in the "miscellaneous" pile on your workbench. Pull the reverse fork and lay it aside.



12

Pull the detent ball and spring for the reverse shift fork and lay them aside so they don't fall out and disappear into the nearest floor drain. Don't forget them at reassembly. Also be sure to check for proper detent alignment and spring action when you put things back together.



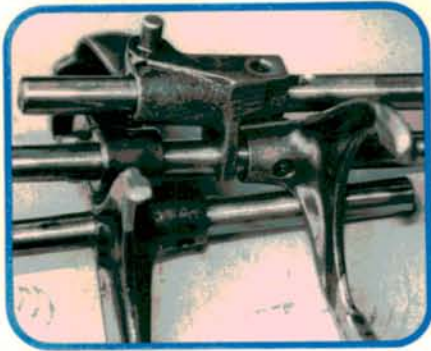
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The three remaining shift forks are bolted to the shift rods. Each is a hardened shoulder bolt held in place by locking tabs that locate on the shift fork and are peened over the bolt head. Bolt torque is a mere 17 Nm (12 ft/lb). Use a drop of thread lock and new locking tabs at reassembly.



14

Bolts removed? Slide 5th/reverse selector shaft upwards and swing the shift guide off to the side. Next remove 1st/2nd shaft, shift fork, and shift guide. With those two out of the way, you now have enough room to get 3rd/4th shift fork out of its synchronizer sleeve when you raise the shift rod.

**15**

Keep the rods and forks together as shown. Note that the shift fork bolt holes are not threaded all the way through. The threaded portion is away from the bolt heads. If you mistakenly turn the rods 180 degrees, the bolts will tighten, but the forks will be loose and the detent grooves will face the wrong way.

**16**

Now we can remove the main and countershafts together. We had to tap on the input shaft with a soft mallet to coax it from the case. Make sure that both shafts move together. Don't just drive the input shaft into the countershaft or the impact may damage the gears.

**17**

We have some clearances to check with the countershaft still assembled. You'll need a good feeler gauge set to do the job. Check between the thrust washer and first gear. Maximum allowable clearance is 0.18 mm (0.007 in). Replacement washers are available in different thicknesses if adjustment is needed.

**18**

Next check for play in 2nd and 3rd gears where they ride against this spacer plate, as shown. Check on one side of the spacer for 2nd gear, and on the other side for 3rd. Gear-to-spacer standard clearance is 0.05-0.12 mm (0.002-0.005 in) with a wear limit of 0.18 mm (0.07 in).

**19**

Check 4th gear end play between the gear and the thrust washer that separates it from the bearing. Clearance specifications are the same for 4th as they were for 2nd and 3rd gears. Remember that the shaft must be fully assembled with the end nut properly torqued to take these measurements.

**20**

So what if a gear has too much end play? Replacement spacer collars may solve the problem if the gear faces themselves are not too badly worn. Measure the height of the old gear collar and compare that to available replacement sizes to see if a new, longer collar will solve your problem. (To be continued.)