

## FUN WITH TRANSMISSIONS

# A Quick Look at Honda Five Speeds



by Bill Brayton  
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If you've had the pleasure of rebuilding the Honda BYBA five-speed transmission, you know this unit doesn't present an unusual amount of challenges for the rebuilder. But there are some areas which require extra attention.

In this issue of *Fun with Transmissions*, we're just going to look at some of the more important aspects of rebuilding the Honda 5-speed unit. For a complete rebuild procedure, ATRA's new Honda manual will be available at this year's Expo and through the BookStore in November.

### Teardown

To remove the gears before removing the main case, always use a puller (figure 1). As tempting as it may be, *never* use pry bars and a large hammer. The hammer will most likely damage the threads on the shaft, and the pry bars could easily chip the gear teeth.

Sounds like a no-brainer, right? But who hasn't tried to cut a few corners when they were in a hurry? This isn't a good place to

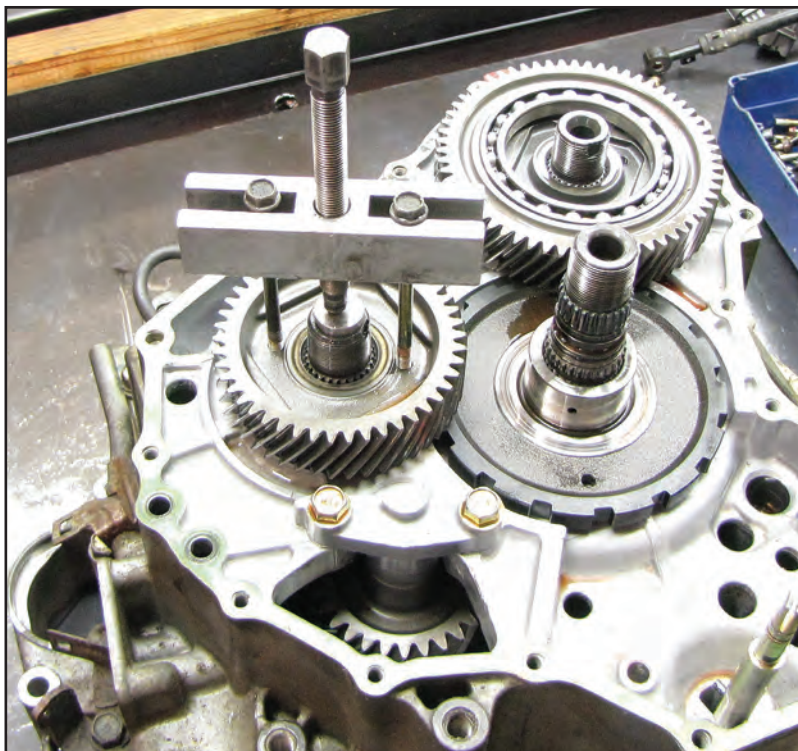
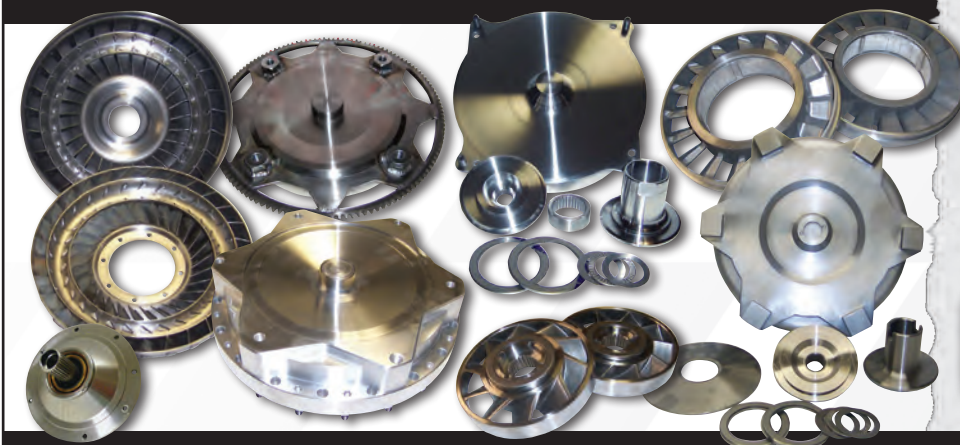


Figure 1

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**After recording the locations and removing the solenoids, remove the tubes from under the CPC solenoid bodies**

try to save time.

After recording the locations and removing the solenoids, remove the tubes from under the CPC solenoid bodies (figure 2). Notice that the screens face *into* the tubes. Be sure to get the small tube out of the case under the CPC C. (figure 3)

Carefully inspect the screens for debris. Clogged screens can cause lazy or flared shifts (figure 4).

The valve body bolts are different lengths; pay attention to where each bolt belongs while removing the valve bodies. If you forget, drop them into place: When you drop them into the proper locations, the bolts should stick out about 10mm before you thread them in (figure 5).

Of all the parts in this transmission, the valve bodies should receive the most attention. But in the field the valve bodies tend to be the most overlooked part of the rebuild.

Always disassemble the valve bod-

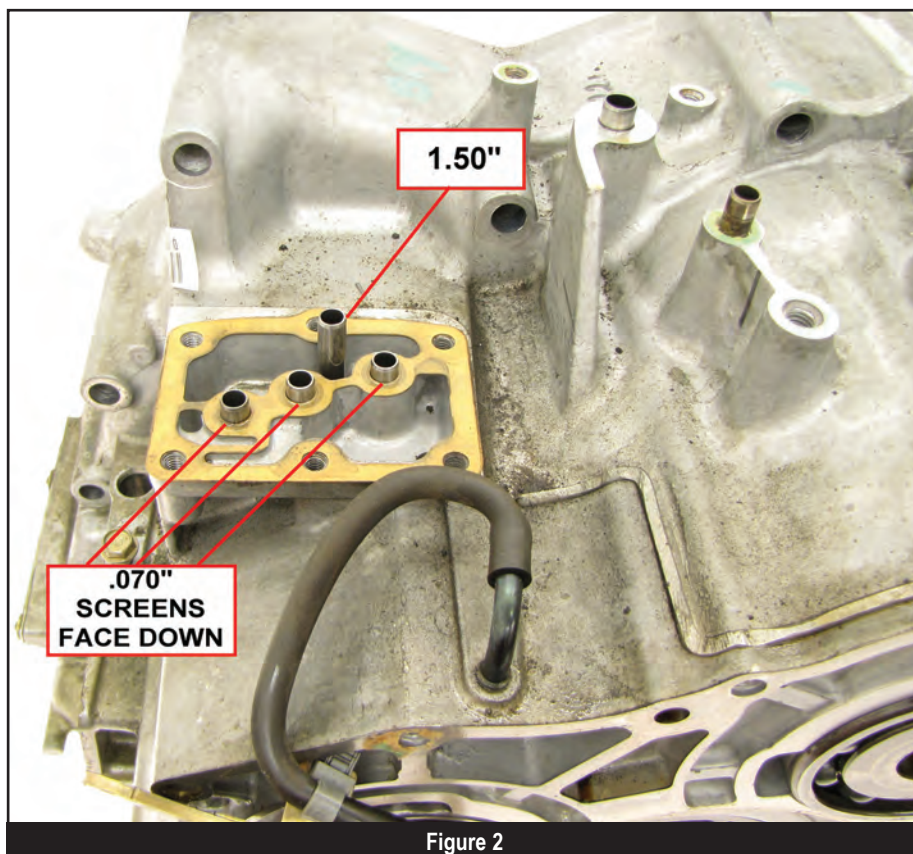


Figure 2

ies completely during every rebuild (figure 6). The valves should drop freely of their own weight, all the way to the end of the bores. This is critical for proper operation after your rebuild.

### Solenoids and Pressure Switches

There are a lot of differing opinions about replacing solenoids. Many technicians have never changed a CPC

solenoid block and never had a problem. Others change the CPC solenoids on every rebuild to prevent problems.

What's important to remember is that the CPC solenoids have *everything* to do with shift feel on these units. The good news is, if you run into any problems with shift feel after a rebuild, these solenoids are easy to change without removing the transmission from the car.

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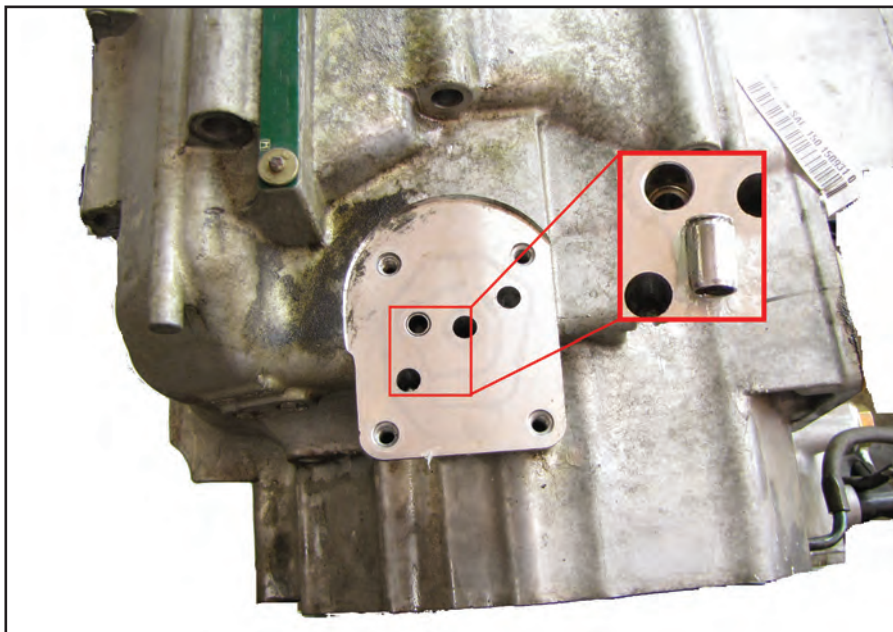


Figure 3



Figure 4

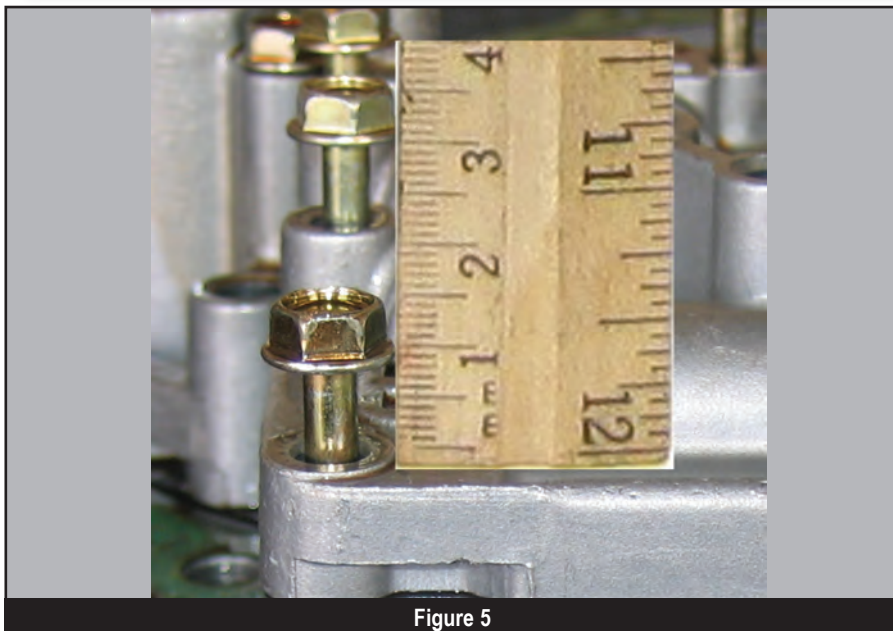


Figure 5

The pressure switches are very sensitive. *Never* wash these switches; too many techs have washed them in solvent and those switches never worked right again.

### Low Sprag

Always disassemble the low sprag. This sprag wears into the 1<sup>st</sup> gear so cleanly that it looks like it was machined that way. If you see any wear on the sprags or the 1<sup>st</sup> gear, replace the sprag elements and the 1<sup>st</sup> gear.

To make sure your rebuild will last well past the warranty, there are a few areas that will make the difference between a unit that works great and one that just squeaks by:

### Clutch Pack Clearance

Don't take clutch pack clearances lightly: Be very picky with them. It's always a good call to set the clutch clearance toward the lower end of the specifications (figure 7).

### Shaft Bushings

The bushings down in the shaft are critical for proper clutch apply. These bushings provide the seal between the tube and the shaft. To check the bushings:

- Apply a small piece of cellophane tape to the end of the tube. This tape is usually about 0.0015" thick.
- Slide the tube into the bushing.

If the tube passes through the bushing and doesn't damage the tape, the bushing is worn; replace it (figure 8). There are several companies that offer tools to remove and install these bushings.

The main cause of bushing wear can be traced to the shaft bearing bore in the case. Over time the case bore wears and allows the shaft to move from side to side, causing the shaft bushings to wear out. If the main case is worn, you'll need to repair or replace it.

### 3<sup>rd</sup> Clutch Drum

Most of these units come in with the 3<sup>rd</sup> drum completely destroyed. Research is ongoing to determine what causes this failure. Most units should go out the door with a new 3<sup>rd</sup> clutch drum.



June 15th: Lanesboro, the yard with two pairs of horses

June 16th: Moved the '64 Chevy to Bill's house

June 22nd: Transported the horses to the county fair

June 24th: Picked up the horses. Apparently, Amy bought another one

June 27th: Camping trip to Wyoming

June 30th: Hauled round bales to a ranch in the next county

July 2nd: Towed local rock band's equipment trailer to an out-of-state show

July 4th: Took the camper out to Colorado for the holiday

July 8th: Pulled the neighbor's car out of the ditch

July 11th: Delivered a triple-axle trailer to Alabama

July 12th: Brought home a new farm tractor

July 17th: Three-year anniversary of replacing the truck's stock transmission with a Road Ripper

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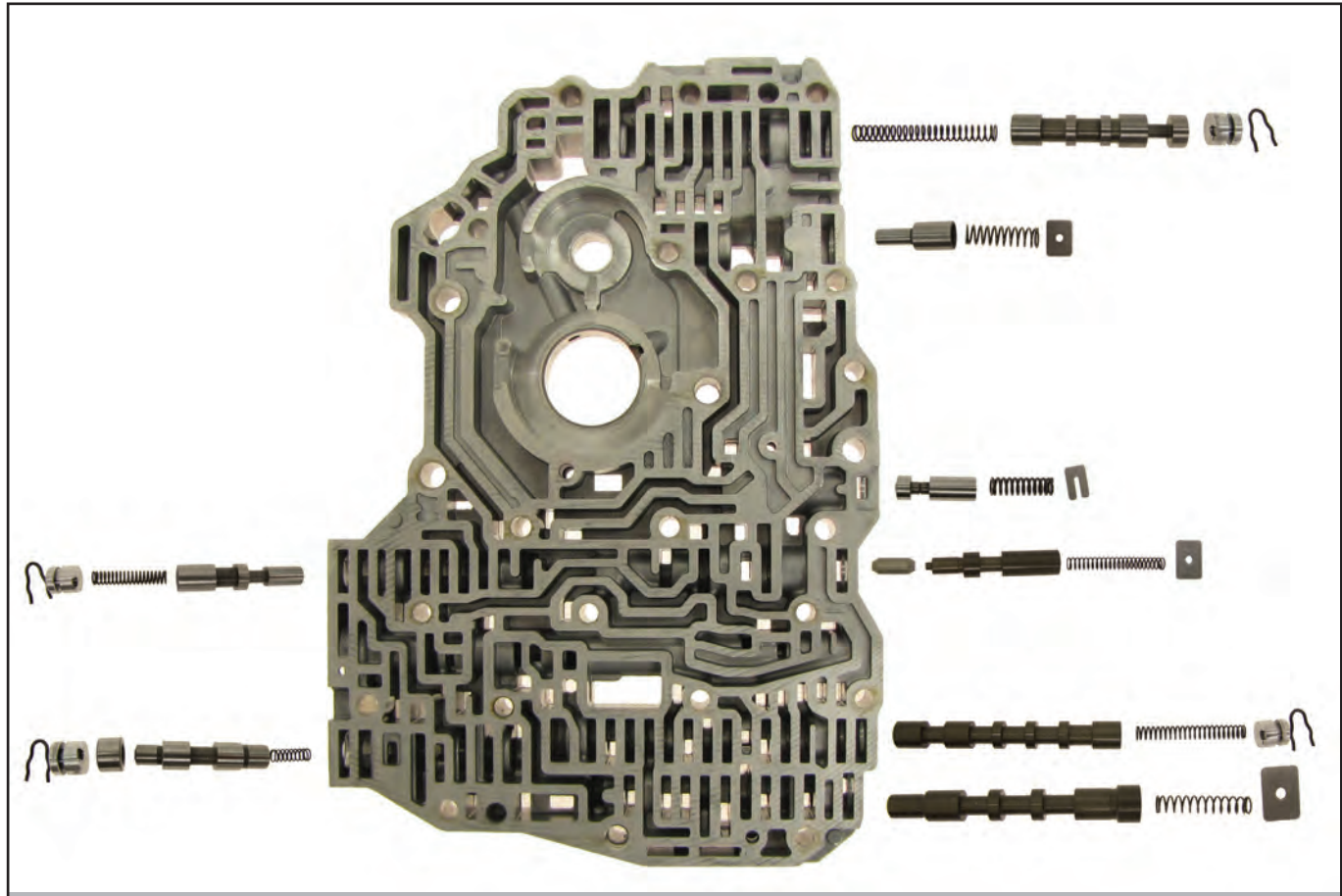




Figure 6

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777	1.7"	6.6"	12.9"	11.2"	FEMALE 7/8-14 O-RING x 37" JIC MALE FLARE (-12 AN)
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#### Honda 5 Speed Transmission Clutch Clearance

1st Clutch	0.043-0.051 inch (1.1-1.3mm)
2nd Clutch	0.028-0.035 inch (0.7-0.9mm)
3rd Clutch	0.028-0.035 inch (0.7-0.9mm)
4th & 5th Clutch	0.020-0.035 inch (0.5-0.9mm)

Figure 7



Figure 8

### Feed Tubes

The feed tubes are different lengths, which really isn't much of a problem if you have enough time to figure out where each tube goes. But time is often at a premium in a busy shop.

Use a digital camera to snap a picture of the tubes before you remove them to make installation easier. Or you can refer to figure 9 for tube heights.

### Checking Shaft Clearances

Checking shaft clearance is another step toward a complete, quality rebuild.

Checking the shaft clearances can be time consuming if you press the gears on and off the main and countershafts. The easy way to check the clearances is to use spacers for this procedure and eliminate the press-on and pull-off steps. In figure 10, the park gear from the countershaft is used as a spacer for the secondary shaft.

Did you know there's a park lever stop adjustment, and a specification for the distance from the pawl shaft to the park lever roller pin? You can adjust this distance using different thickness park pawl stops (figure 11).

For an example of this adjustment, we'll check the park lever stop adjustment on the unit I'm using for the latest rebuild book.

- Install the park pawl onto the shaft using an old bearing race

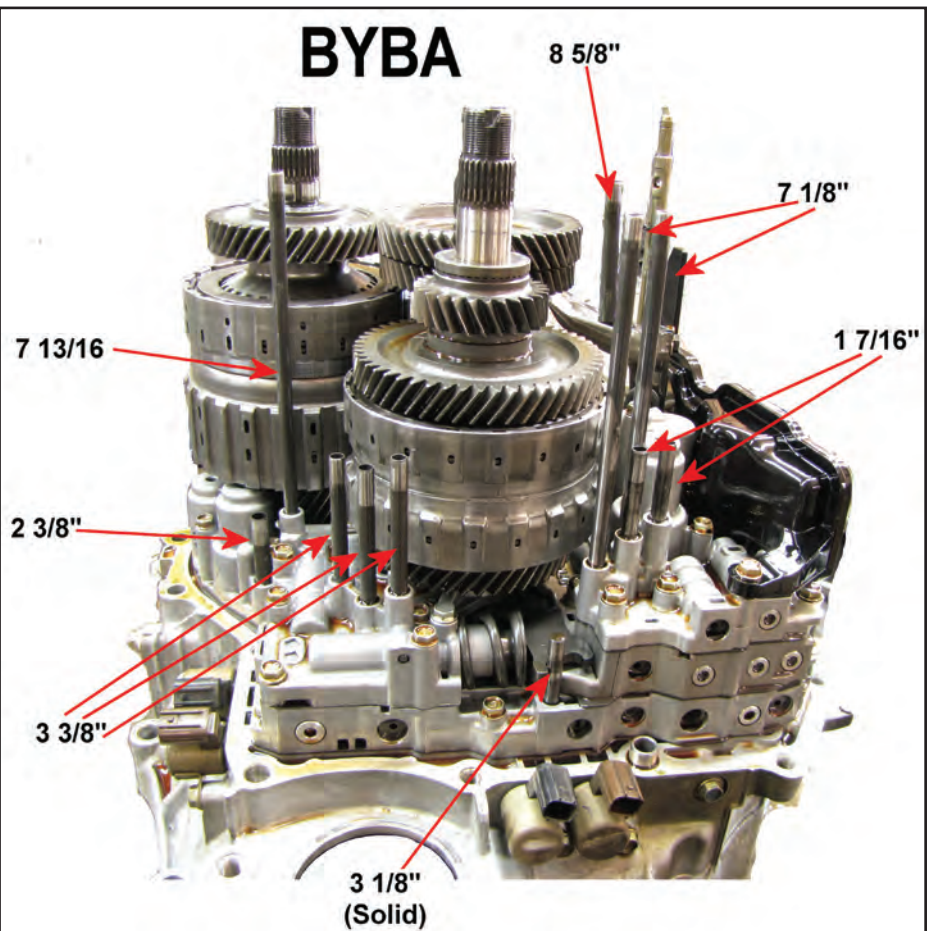


Figure 9

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Figure 10

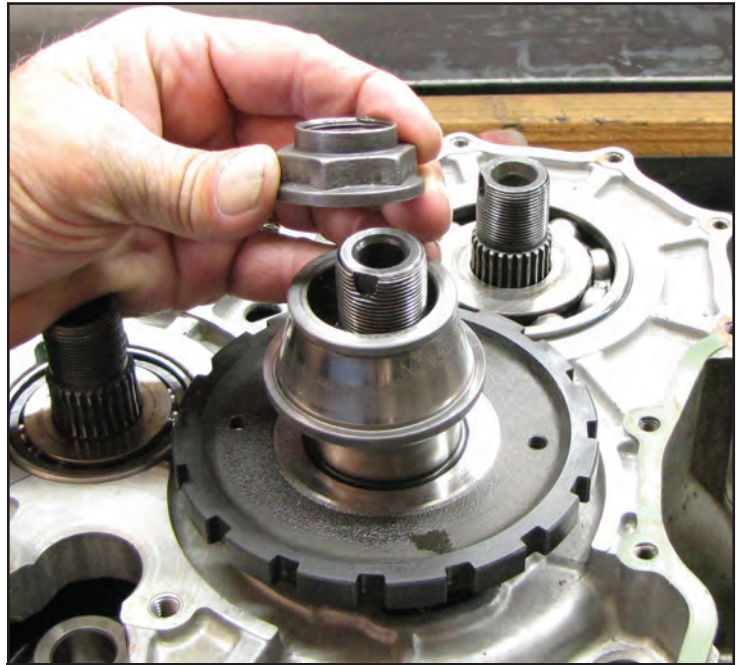


Figure 12



Figure 11

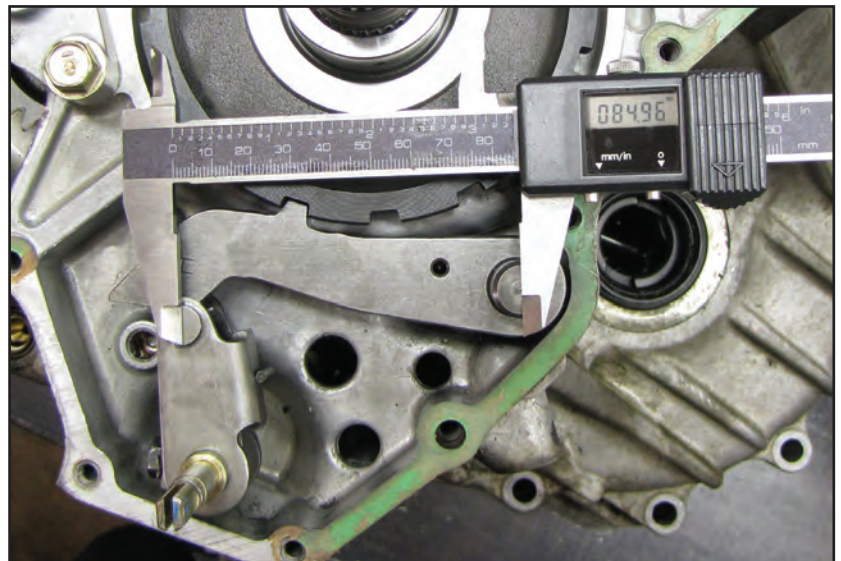


Figure 13

from a differential overhaul as a spacer (figure 12).

- Install the pawl and shaft.
- Secure the park pawl stop and park pawl roller arm onto the shaft with a 10mm shouldered bolt.
- Place the shifter in park
- Measure from the center of the park pawl roller to the park pawl shaft.

The measurement should be 84.6mm–85.6mm (3.33”–3.37” Figure 13). If it's out of specification, the park pawl stop comes in 3 different thicknesses. The park pawl stop is numbered

1-3 (figure 11); number 1 is the thickest and 3 is the thinnest.

Take your time and be meticulous as you go through these late model, 5-speed units. Don't skimp on the valve bodies, even if there's a rush on the job.

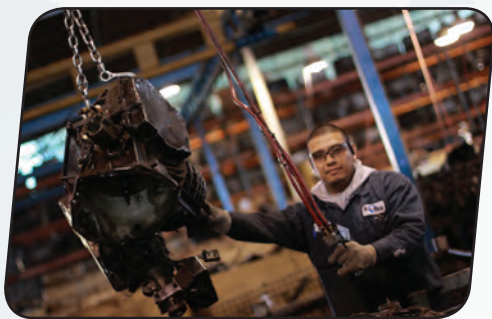
Doing the job right the first time is the payoff here. If this unit has to come back out because you overlooked something as simple as a dragging valve, the job moves from the profit to the loss column. Just ask any shop owner or manager if he wants to chance having one of these units come back out of the car because you didn't have the time to do the job right the first time.

A little care and attention to detail is the key to a successful rebuild. And it's one of the best ways to make sure you're having fun with transmissions.

*Special thanks to H&A Transmission, in Rancho Cucamonga, CA, and H&A's general manager, Rory Parker, for the use of the transmission.*







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