Honda Transmissions and the P0740 After-Rebuild Blues

by Bill Brayton

There is nothing better in a transmission shop when a Honda Accord hits the ground after a rebuild and road tests are perfect. The shifts are smooth and on time. The lock up performs exactly as it was designed to do. This is the scenario that we all work for. The R&R man is happy, the builder is proud of a job well done and finally everyone in the shop is happy because most importantly of all, the person who signs the paychecks is happy.

WAIT A MINUTE!!

Here's what really happened: It's Friday morning, and everyone in the shop is in a frenzy to get the last few cars out the door for the weekend.

The R&R man finishes installing the transmission in a late model Accord. He tops off the ATF and hands the keys to the service writer for the road test. The service writer returns and talks to the rebuidler or diagnostician: The D4 light on instrument cluster is lit. Out comes the scan tool, and sure enough, it has a P0740 code in memory.

Code P0740 can ruin a Friday afternoon in no time. As most of you know, rebuilding a Honda Accord is a very labor-intensive and expensive job. When something goes wrong with the transmission, it can turn what should have been a pleasant, profitable job into a nightmare.

In the Honda factory manual, a P0740 code is described as "a problem in the lockup control system (figure 1)." Well, that certainly clears things up! Basically the manual says if you've replaced the solenoids and the code resets, the fix for a P0740 code is to replace the transmission and the torque

DTC P0740: Problem in Lock up Control System

Note:

- Record all freeze data before you trouble shoot
- Keep replacement solenoids on hand:
- Torque converter clutch solenoid valve/shift solenoid valve A
- A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code. Does the OBD II scan tool indicate another code? **YES** - Perform the troubleshooting Flowchart for the indicated Code(s). Recheck for code P0740 after troubleshooting. **NO -** Go to step 2. **NOTE**: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.
2. Measure the line pressure. Is the line pressure within service limit? **YES** - Go to step 3. **NO** - Repair the hydraulic system as necessary.
3. Replace the torque converter clutch solenoid valve/shift solenoid valve A.
4. Replace the A/T clutch pressure control solenoid valves A and B.
5. Turn the ignition switch OFF and reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for **more than ten seconds.**
6. Using the scan tool, check to be sure the engine coolant temperature is **176˚F (80˚C) and above.**
7. Drive the vehicle at **55 mph (88km/h)** constantly for **more than one minute.**
8. Recheck for code P0740. Does the OBD II scan tool indicate code P740? **Yes** - Replace the transmission and the torque converter. **NO** - The system is OK at this time.

Figure 1

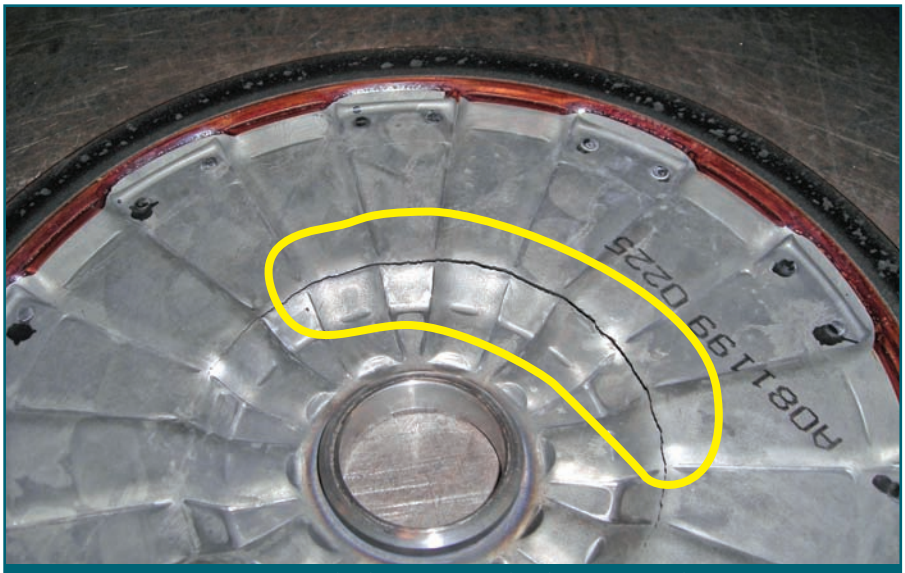

Photo courtesy of Joe Rivera at Pro Torque.

Figure 2: Cracked Converter Clutch Pressure Plate

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converter. Yeah, right!

Here on planet Earth, we know there are many things that can cause a P0740. One common scenario is a parts mismatch, a situation that was covered in the Nov/Dec 2005 issue of *GEARS Magazine*. Another possibility is damaged parts (figure 2).

This time in *Fun With Transmissions*, we're going to look at how the torque converter lockup system works, and what we can do to get rid of those after-rebuild blues.

Lockup Hydraulics

The valve body and Clutch Pressure Control (CPC) solenoids A and B work together to create lockup. There are three valves that control lockup: the lockup shift valve, the lockup timing valve and the lockup control valve. Shift Valve C determines which CPC solenoid will be controlling lockup feel, depending on which gear the transmission is in when lockup occurs.

Let's get right to the hydraulics diagram to dissect the parts and study how they produce lockup:

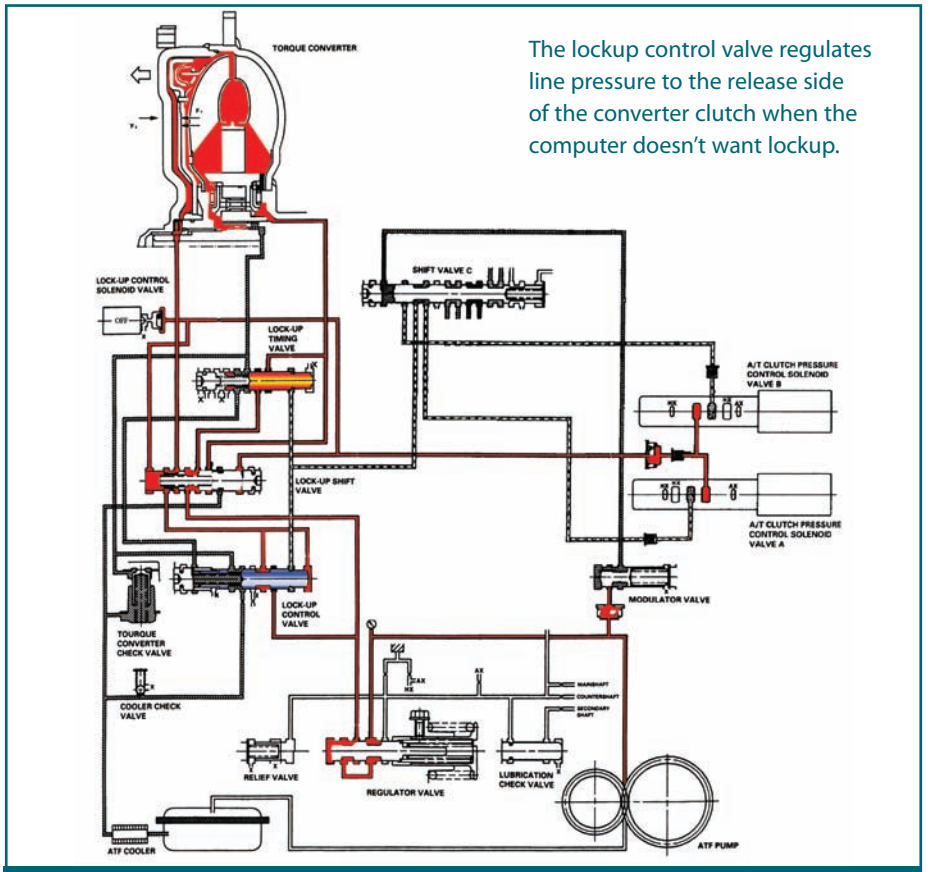
Both clutch pressure control solenoids A and B can work the lockup timing valve and the lockup control valve. Shift Valve C is controlled by shift solenoid C.

In 1st and 3rd gears, shift solenoid C is on. In this position, clutch pressure control solenoid A controls the lockup control valves. In 2nd and 4th, shift solenoid C is off. In this position, clutch pressure control solenoid B takes over the duties of moving the lockup control valves.

The lockup control valve regulates line pressure to the release side of the converter clutch when the computer doesn't want lockup (figure 3). As soon as the computer starts commanding lockup, the lockup control valve starts moving to the left to begin draining oil away from in front of the converter clutch.

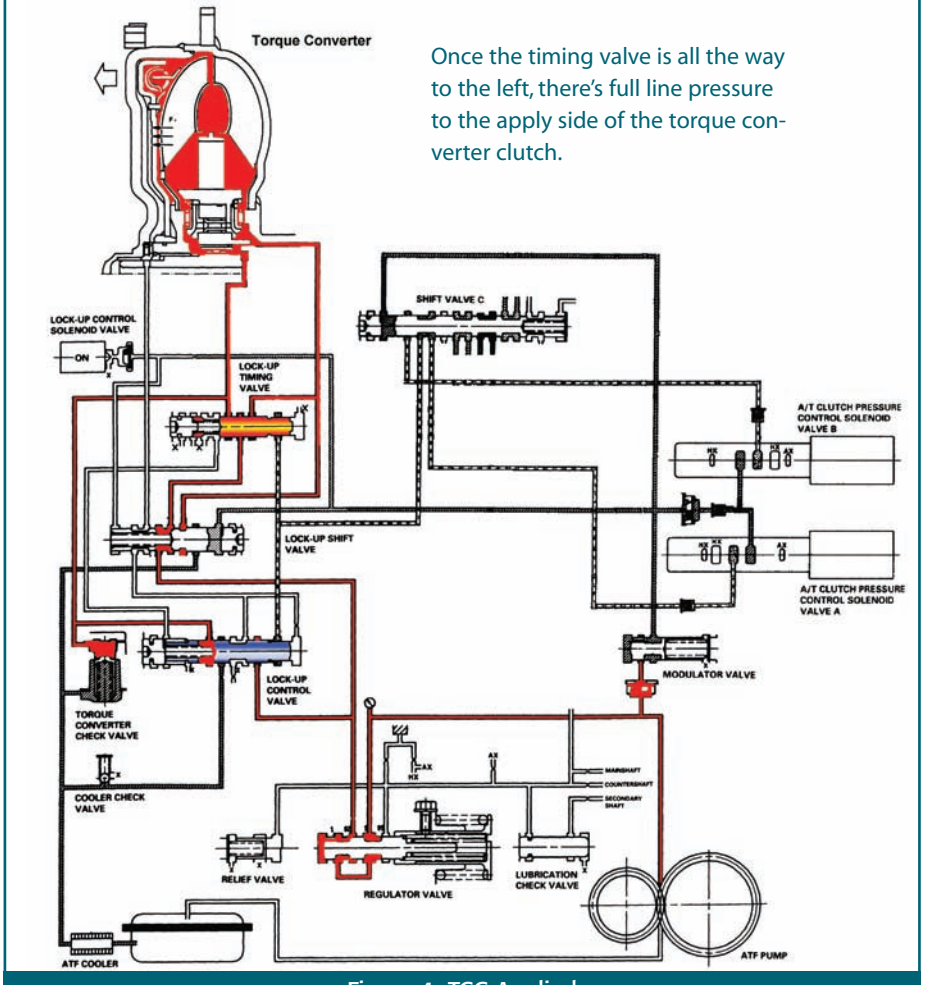
As the CPC pressure increases, the lockup control valve will transition from a regulator valve to a switch valve. When the valve is in switch valve mode, it releases all pressure from in front of the converter clutch.

The lockup timing valve actually controls the apply side pressure in the torque converter. The timing valve and



The lockup control valve regulates line pressure to the release side of the converter clutch when the computer doesn't want lockup.

Figure 3: TCC Released



Once the timing valve is all the way to the left, there's full line pressure to the apply side of the torque converter clutch.

Figure 4: TCC Applied

the control valve are operated by the same oil: As the pressure builds from the CPC solenoid, the timing valve moves to the left to open the passage to mainline pressure. Once the timing valve is all the way to the left, there's full line pressure to the apply side of the torque converter clutch (figure 4).

The modulator valve regulates line pressure to the all of the solenoids. Other transmissions call this a *solenoid regulator valve*. The difference here is that the modulator valve applies pressure to the end of the lockup shift valve and shift valve C to hold them in position. The modulator oil is always there. The valves move by applying or releasing pressure to the opposite end.

The Nuts and Bolts of TCC Operation

There was a time that picking the valves and dunking the valve body in solvent was adequate for cleaning the valve body; those days are long gone. Back then we nailed things down with a speed wrench, or worse, a small impact gun.

The key to keeping these valves working properly is getting things clean… I mean spotless. This also means removing all the valves from all of their bores. Repeat after me: "We need to pull every valve out of every bore, on every Honda, every time" (figures 5a and b). This may be the single most important thing that you can do to prevent comebacks on any Honda transmission. The guys who follow this simple rule reduce their chances of having a bad Friday afternoon, courtesy of a Honda comeback, by about 98%.

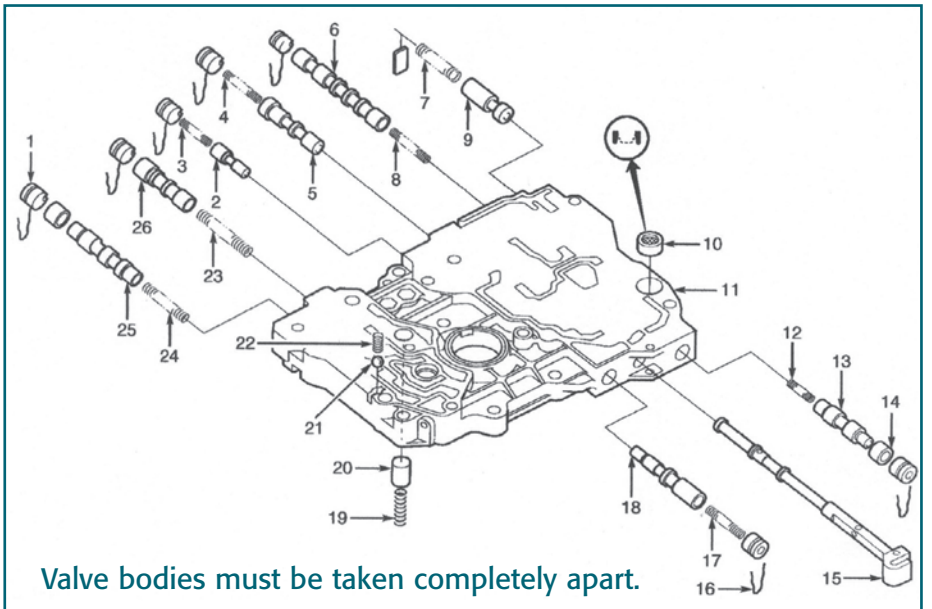


Figure 5A

One other area to pay attention to while working on the valve body is the end plugs. These plugs can become worn in their bores. When these plugs leak it causes the whole system to break down and work much slower than designed. To correct those leaks, there are O-ringed end plugs available from the aftermarket, or you can make your own.

To make your own O-ringed end plugs, you'll need a small lathe:

- Install the end plug into the valve body and secure it with its retaining clip.
- Scribe a line on both sides of the partition closest to the valve/spring (figure 6).

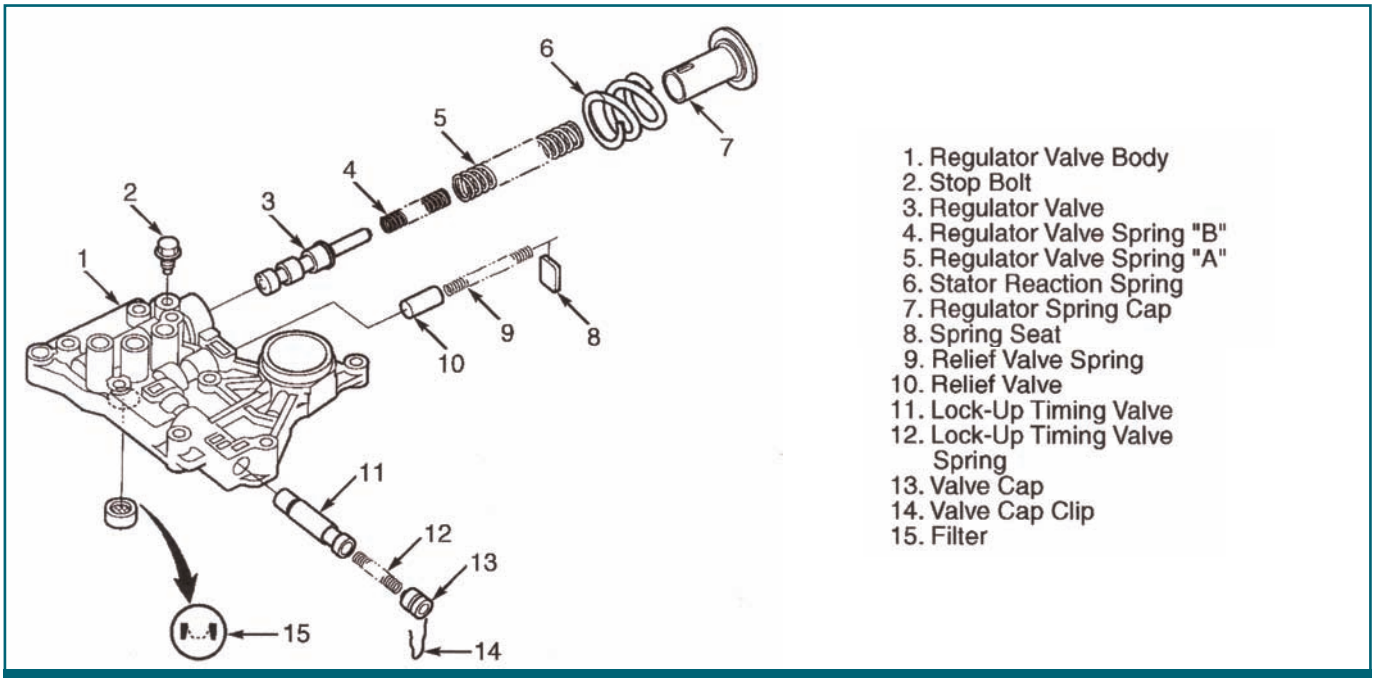


Figure 5B

- Use the lines as a guide for cutting the O-ring groove. The groove should be offset toward the valve/spring to help compensate for the flexing of the retainer clip and movement under pressure (figure 7).
- The solenoid O-rings will fit perfectly in the new groove (figure 8).

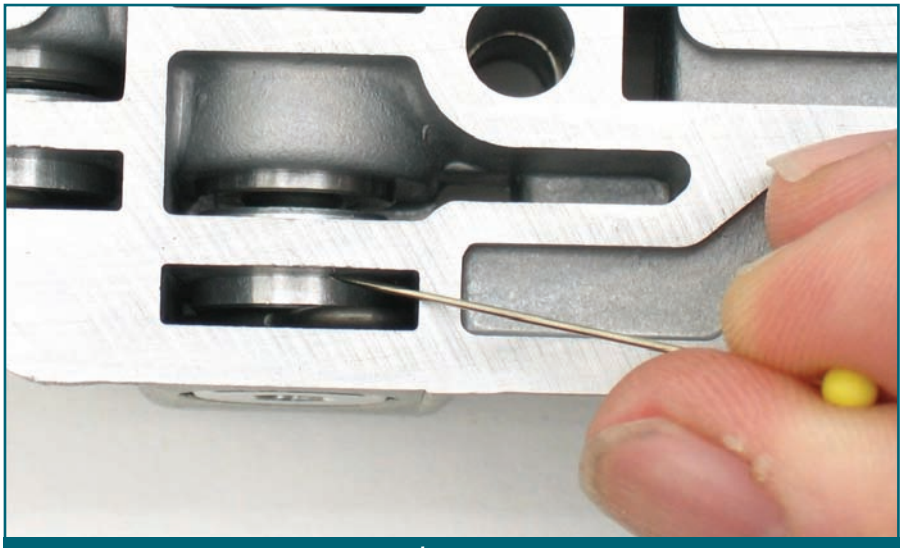


Figure 6

Rebuilding Honda transmissions can be a very profitable venture, as long as you do the job correctly… the *first* time. Those who've learned this lesson the hard way know that if you have to remove a Honda transmission a second time, the profit margin drops significantly.

When you pay attention to cleanliness, take the time to remove the valves from the valve body, and pay attention to detail, the job will go smoothly, and everyone from the R&R person to the shop owner will have more *Fun With Transmissions!*

Figure 7

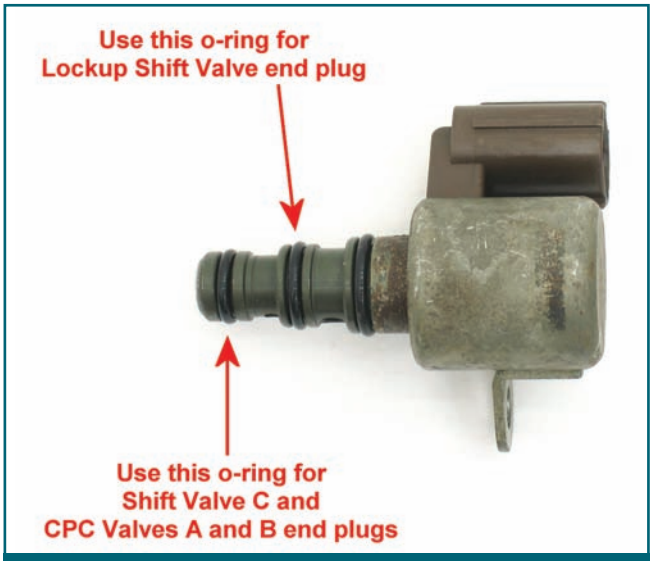


Figure 8

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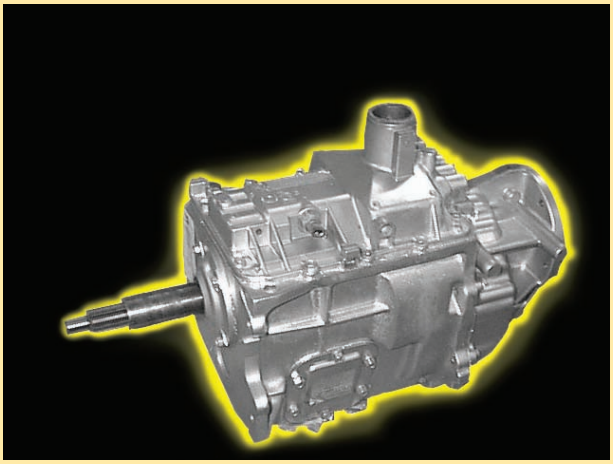

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