



by Lance Wiggins

4L60/65/70E: Parts Interchange, and Immediate Failure after Rebuild

Sometimes parts interchanges can be the death of you... whether it's about the cost, the headache, or the black eye, it can be bothersome to both you and your customer. That's why it's important to have the right information, so you can avoid problems caused by using parts from different years, or even different transmissions.

In this issue of *Let's Play Ball*, we're going to explore the 4L60/65/70E stator support and pump assembly interchange, and the updates that have been made to them.

The Update

A major update went into effect on the 4L60E/65E transmissions. This update for the 2006 model year actually started in 2005, and it included the introduction of an input speed sensor (ISS) on "some models" (figure 1). The update was fully implemented for the 2007-and-later model years.

The ISS system was designed to help the computer make input speed calculations, resulting in a more accurate transmission diagnosis.

Unfortunately, as with other changes in the past, they began production on these changed components before they were ready to implement them completely, so some of the parts were pulled forward into mid-2005 model year applications in preparation for the rollout of the completed ISS system. What exactly does that mean? It means we'll have parts that *look* like they belong, but aren't going to work. In addition, a new model transmission came from this concept: the 4L70E.

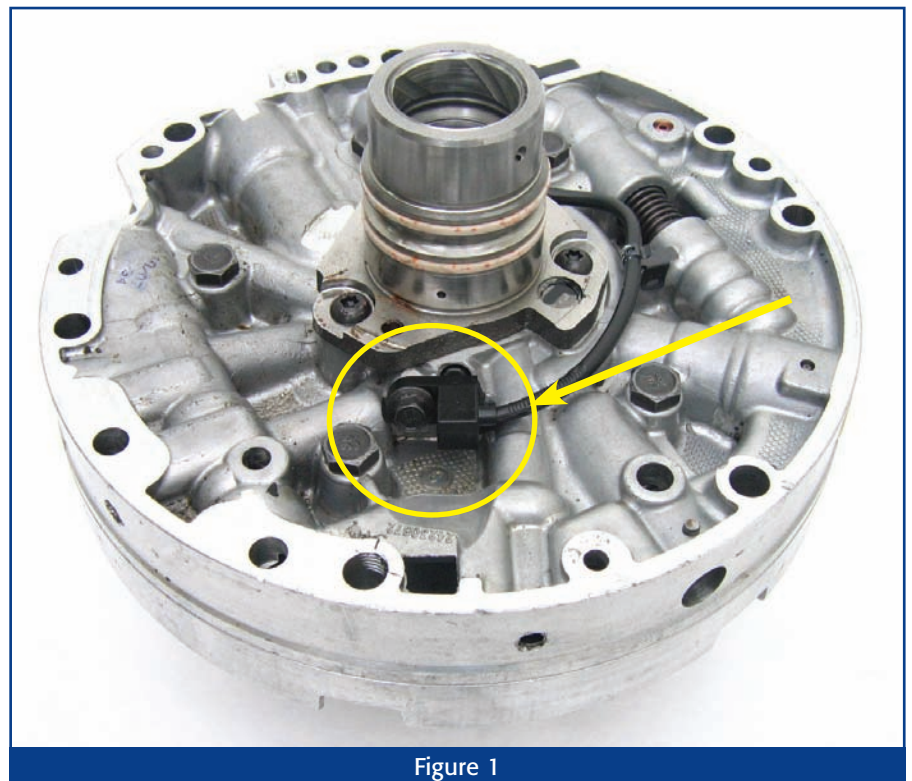


Figure 1

Several hardware changes were implemented to launch the ISS system. Many of the changes occurred in stages. Some of the changes were required to make room for the new input speed sensor, while others were required to allow the ISS to function.

These updates include:

- Shortening the reverse boost pressure regulator valve lineup
- Casting changes within the pump assembly to relocate the S3 bore boss
- Casting changes relocating the TCC release bore
- Changes to stator support sleeve passages
- Changes to the turbine shaft: reluctor teeth were added to provide

sensor operation, and the sealing ring grooves were repositioned.

- Changes to the transmission wiring harness to accommodate the addition of an input speed sensor (on applications not using an ISS, the sensor hole will be plugged).
- Shift control features were enabled in the software that weren't used fully in previous applications
- 2 DTCs were added for the ISS system: P0716 and P0717.

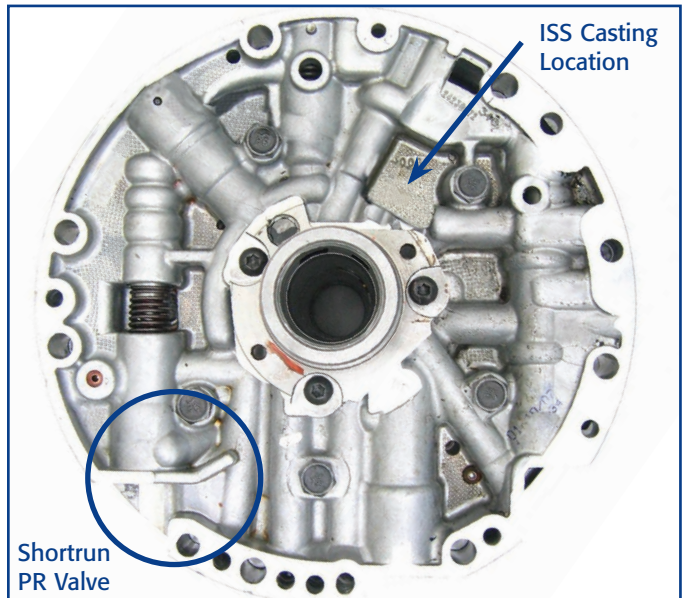
Interchange Problems

The interchange problem lies in the third and fourth design applications and the stator support sleeve.

There are five styles of pump assemblies:



Figure 2



Shorrun
PR Valve

Figure 3: Casting Features

1997-2005: No input sensor boss; used 1st design stator support sleeve, input shaft and 1st design P/R valve train (figure 2).

1997-2005: No input sensor boss; used 1st design stator support sleeve, input shaft and 1st design P/R valve train (figure 2).

2005 1st design: No input sensor boss; used 1st design stator support sleeve, input shaft and 2nd design P/R valve train (figure 3).

2005 2nd design: Includes an input speed sensor boss, but the boss isn't drilled; 1st design stator support sleeve, input shaft and 2nd design pressure regulator valve train (figure 4).

2006: The input speed sensor boss was drilled on those

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**2005 2nd design:
Includes an
input speed
sensor boss, but
the boss isn't
drilled; 1st design
stator support
sleeve, input
shaft and 2nd
design pressure
regulator valve
train.**

models that used an ISS. A 2nd design stator support sleeve and 2nd design pressure regulator valve train were used. This combination requires the ISS shaft design or a shaft design that relocates the turbine shaft sealing rings (figure 5a, 5b).

2007-and-Later: All models of pumps use the input speed sensor boss and all of the bosses are drilled. If the ISS isn't used, a rubber plug will fill the ISS hole. A 2nd design stator support sleeve and a 2nd design P/R valve train were used. This combination requires the ISS shaft design or a shaft design that relocates the turbine shaft sealing

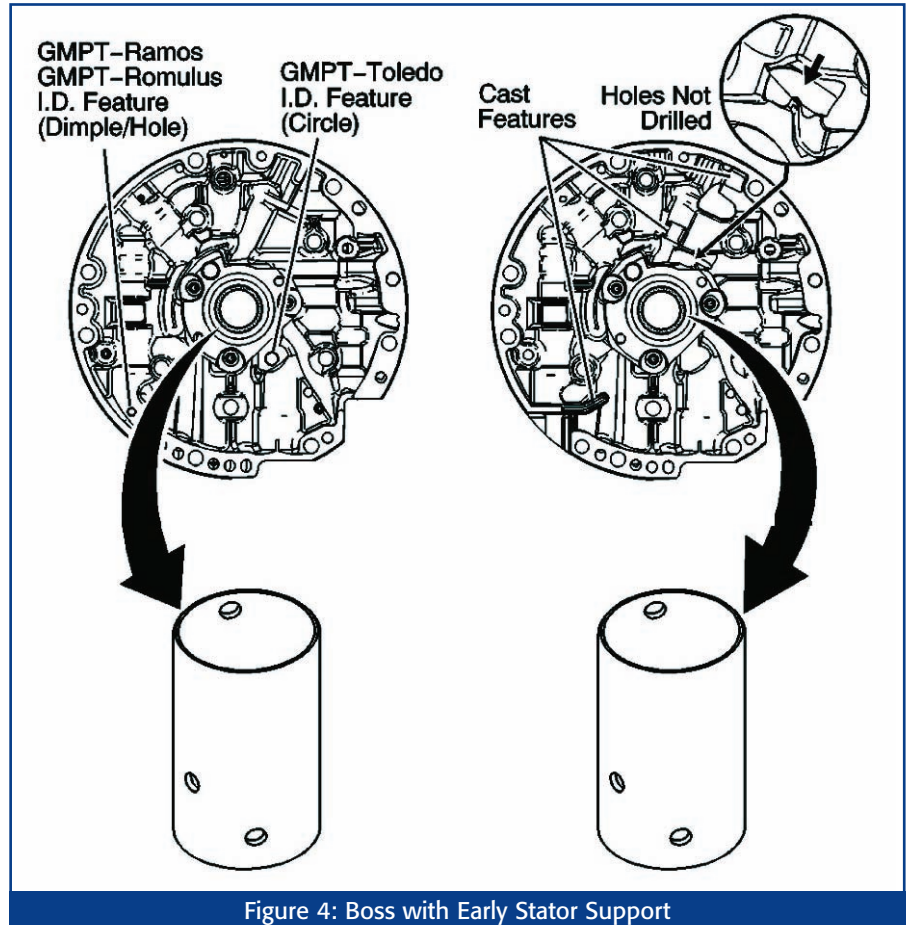


Figure 4: Boss with Early Stator Support

rings (figure 6a, 6b).

In a nutshell, the stator support assembly and the input shaft are the most important components to look at. If you make an interchange mistake here, you will completely destroy the planetary gear set, smoke the clutches,

and cause a general meltdown within a few miles! Yep... you'll probably fry the trans on the test drive; maybe even before it leaves the shop.

Choosing the Right Parts

Like most interim parts, the second

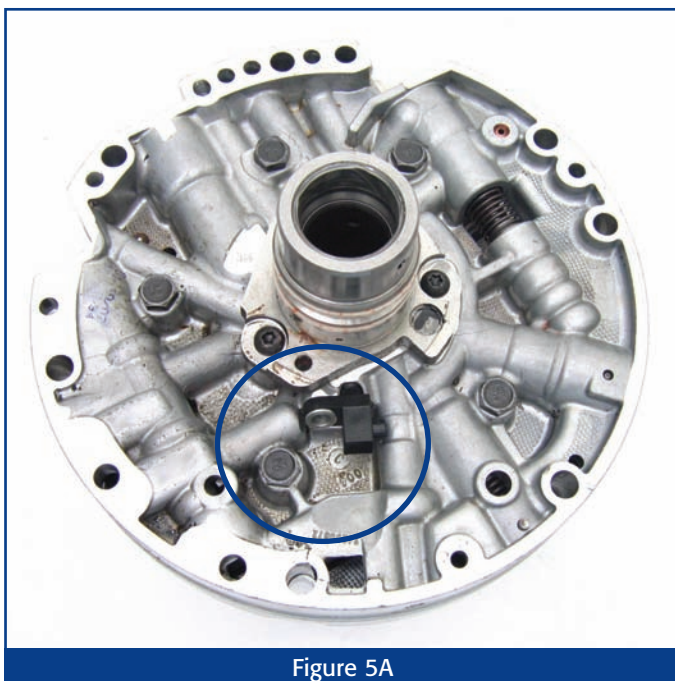


Figure 5A

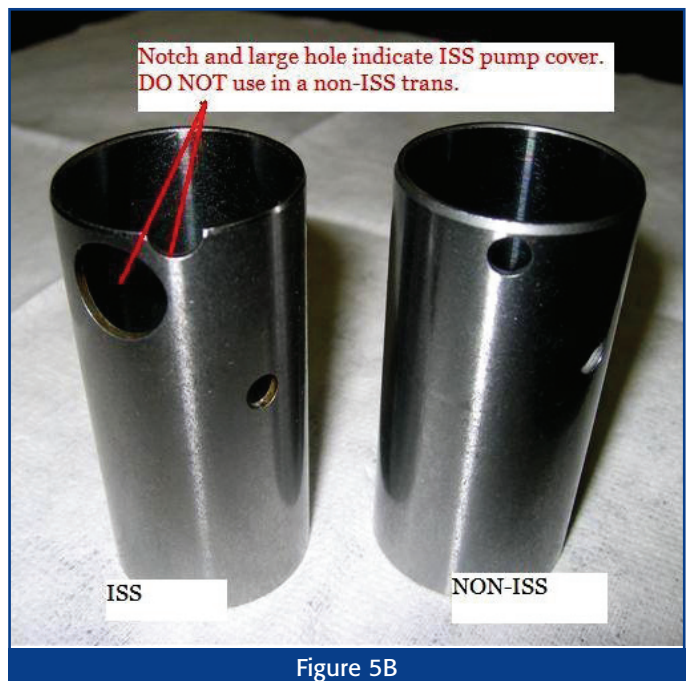


Figure 5B

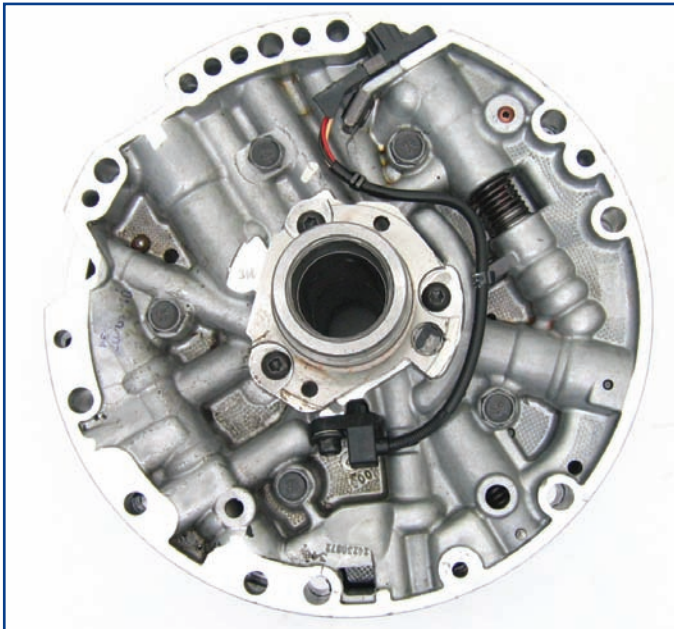


Figure 6A

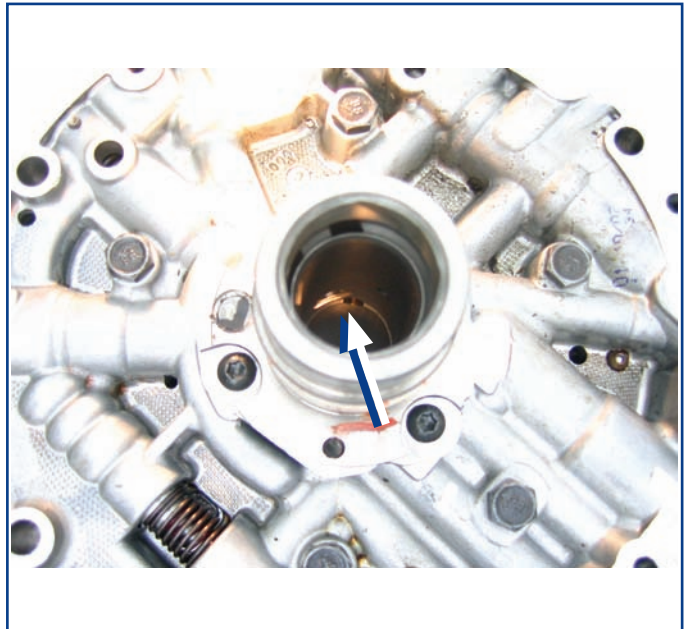


Figure 6B

2007-and-Later: All models of pumps use the input speed sensor boss and all of the bosses are drilled. If the ISS isn't used, a rubber plug will fill the ISS hole.

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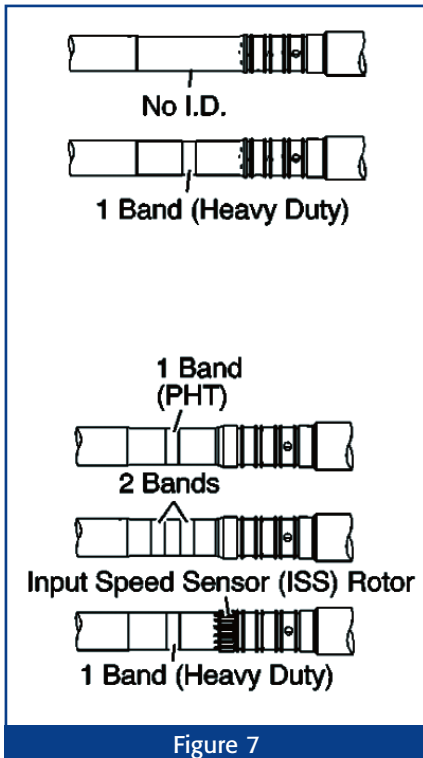


Figure 7

style pump was built with the idea of using it in later units. In other words, build a model and tweak it over the years to reach the final outcome.

There are design variations to the turbine shafts. You can identify which shaft you have by the ID marks on the shafts. The ID mark is simply a 9.5 mm by 0.5 mm groove located on the shaft. Some shafts have ID marks while others don't (figure 7).

Four non-ISS shafts are available:

245mm/258mm (Part #17803688)

280mm/300mm (Part #17803687)

300mm HD/300mm M70 (Part #17803686)

258mm PHT (Part #17803685)

Three ISS-equipped shafts are available:

245mm/258mm (Part #24232438)

280mm/300mm (Part #24230653)

300mm HD/M70 (Part #24230654)

Pump Cover Kits:

1998-2005: 12491417,

124914212006

Later Non-PHT: 24236486,

24236489 2006/07

PHT: 24239202

Reverse Boost Valve Kits:

2005-and-earlier

Long valve train: 24234396 regular,

24234397 High Perf

Short valve train: 24234396 regular,

24234397 High Perf

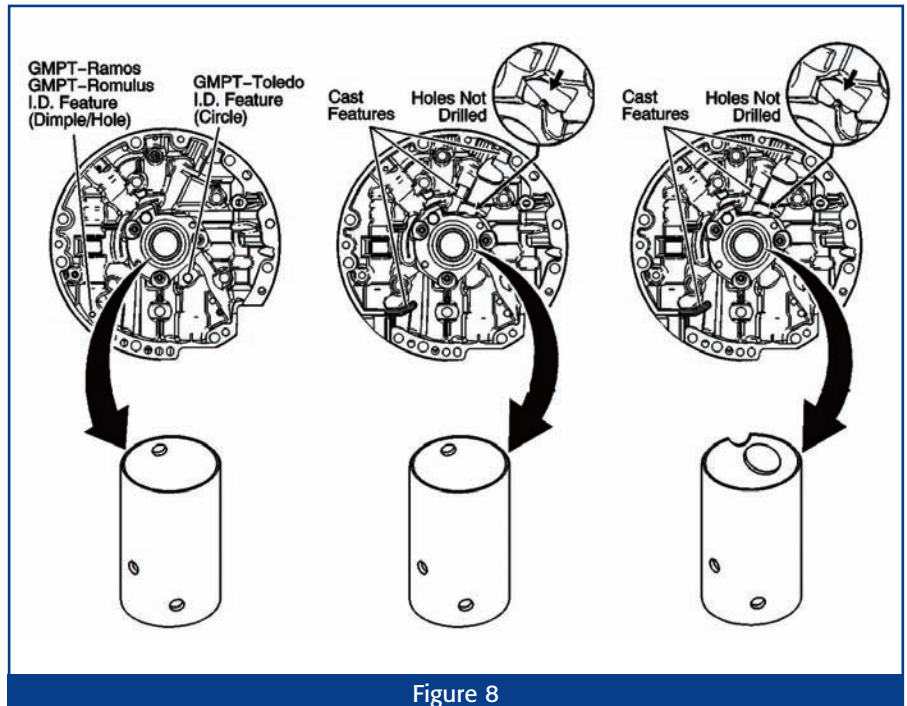


Figure 8



Figure 9

The Bottom Line

If the unit you're building has an ISS or an input shaft with a boss, you *must* have an ISS-equipped pump assembly (figure 8).

If the unit you are working on *doesn't* have an ISS, pay close attention to the input shaft (figure 9):

- If it has a boss, you need to make sure you have the ISS-type stator support sleeve.
- If the input shaft looks like the earlier styles, you'll need the earlier style pump assembly.

If you don't identify the build combination you're working with, you could easily end up dealing with line pressure problems, TCC or clutch apply problems, release crossleaks, or planetary failures.

As you can see, making the right choices in the interchange will be the biggest key to keeping this unit on the road. Until next time, play hard, keep winning, and *Let's Play Ball...*



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