Slipping and Sliding with the 6L80/6L90

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As you're probably aware, the 6L80 and 6L90 are quickly becoming the transmission of choice for many GM vehicles. As the replacement for the 4L60E/4L80E transmissions, the 6L80 and 6L90 are used in many GM applications, including:

- Cadillac STS-V, XLR-V, Escalade, Escalade ESV, Escalade EXT, and XLR
- GMC Sierra, Sierra Denali, Yukon Denali, Yukon XL Denali, Yukon XL, and Yukon
- Chevrolet Silverado, Suburban, Corvette, and Camaro
- Hummer H2
- Pontiac G8

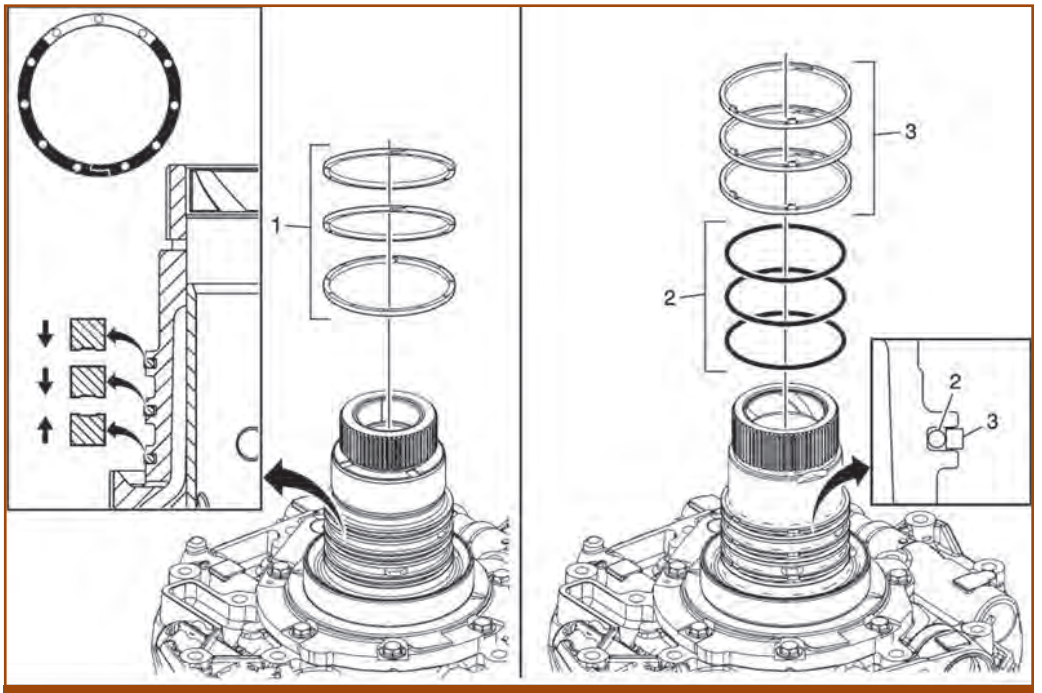

Figure 1: 6L80 2009 Updated pump cover and seals

A quick look at the RPO label in the glovebox or center console will help you identify whether your vehicle is equipped with a 6L80 or 6L90. RPO code MYC identifies the 6L80 while RPO code MYD indicates a 6L90 is on board.

Like anything else on the market, a few growing pains are to be expected when a new transmission is introduced. Among the most common issues heard these days are problems with the 3-5-reverse clutch drum and its operation.

These issues typically revolve around oil leaks in the circuit for the 3-5-reverse clutch. This can generate any of the following complaints:

- Slip in reverse or, in some cases, intermittently no reverse
- Delayed reverse engagement (common with fluid temperatures below 104ºF/40ºC)
- DTC P0776 may set
- Possible hard shifts to 3rd or 5th gears — more common at engine loads below 50%
- Slip in 3rd or 5th gear
- Slip or flare on the 2-3 shift

As you may have noticed, some of the conditions seem to contradict each other; they don't, because they're typically not present at the same time. So a slipping shift can be followed by an aggressive shift the next time. That's because the Transmission Electro-Hydraulic Control Module's (TEHCM) adaptive algorithm simply anticipates the slip shift and corrects for it, resulting in a harsh shift next time.

So what should you look for when faced with a shift or engagement complaint related to the 3-5-reverse clutch? There are several things:

Beginning with the Start of Production (SOP) for the 2009 model year, a major change occurred to the 3-5-reverse system in an attempt to address these conditions. The change revolved around the sealing rings mounted onto the back of the pump (pump cover).

The grooves in the pump cover were changed to accommodate a new design, quad backup ring, and a new design, tabbed sealing ring. The update looks very similar to some of the GM 4-speed, front-wheel-drive, driven sprocket support ring designs.

The updated pump cover has additional machining to allow it to accommodate the updated ring design. The updated rings won't fit on the previous design support. And never attempt to install the old design rings on the new design pump cover support (figure 1).

One common cause for these conditions after a rebuild was that the early design support and rings were directional. The rings have a series of identification marks on them to help you with installation. The first ring is supposed to be installed with the identification marks facing up, away from the pump; rings 2 and 3 should be installed with their identification marks facing down, toward the pump (figure 1). Installing the rings incorrectly will cause sealing ring leaks and the problems discussed earlier.

NOTE: When inspecting the

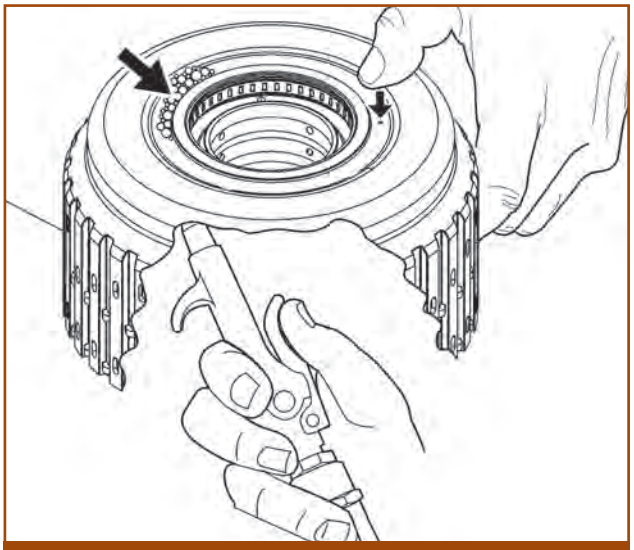

Figure 2: 3-5 reverse leak 6l80

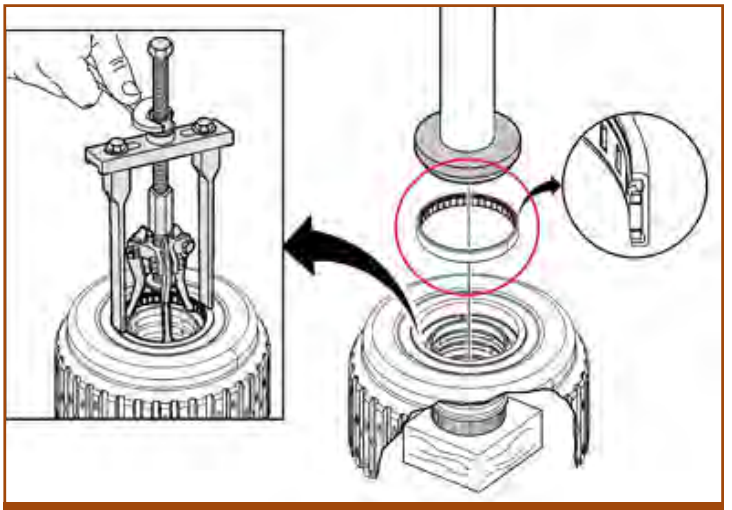

Figure 3: 6l80 3-5 rev bearing

3-5-reverse clutch sealing rings, you may not notice any indication that the rings are damaged.

Another condition that's started to pop up involves cracks in the 3-5-reverse drum. If you're faced with any of these complaints, always air check the drum this way:

- Hold your thumb over the bleed hole in the drum.
- Apply shop air to the drum.
- Apply soapy water around the drum weld and inspect it for evidence of a leak.

If the drum is leaking, replace it (figure 2).

IMPORTANT: If you're replacing the drum, you'll usually need to replace or transfer the bearing mounted in the drum. Don't forget this as the drum relies on this support bearing to position itself properly on the pump cover (figure 3).

As you can see, successful repair of these units involves paying attention to the details. A loss of focus during assembly can result in a comeback and a dissatisfied customer.

If you haven't tackled a 6L80/6L90 yet, jump in: They really are quite easy to work on. And, until next time, remember: Problems are only opportunities in work clothes.