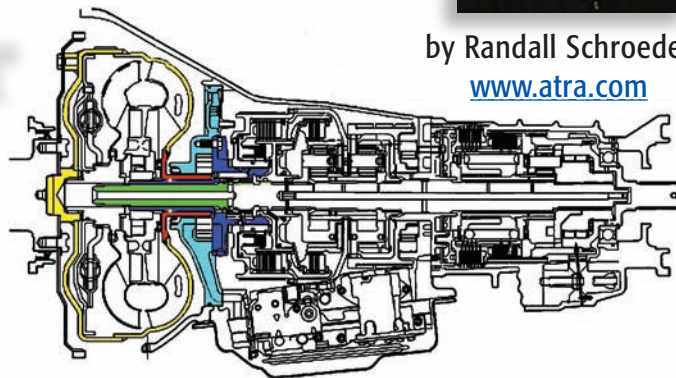




by Randall Schroeder

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# 48RE Torque Converters: An Update for Longer Life



**O**ften in this industry, changes happen to improve a product. As doctors, we need to know whether there's any way to get around the cost of these changes and whether we can reduce patient costs by using earlier production parts.

The problem when thinking like this is often that the reason for these changes is overlooked to save a few dollars. As technicians, we're faced with what I'm going to call the big W's of the RE-series of Chrysler transmissions, specifically the 48RE torque converter changes that have evolved around lockup clutch designs.

These W's are:

- When — When did changes happen?
- Why — Why were these changes made?
- Which — Which parts were updated?
- Where — Where am I going to have to look to identify these new parts, to make sure I have the correct part the first time?
- What — What can I do when changing parts to increase durability?

Almost daily on the ATRA HotLine I'm asked, "Can I use the earlier 46/47RE torque converter with this 48RE transmission?"

We've heard everything from, "My parts supplier doesn't have the replacement part," to, "the cost is so much higher and I want to save money."

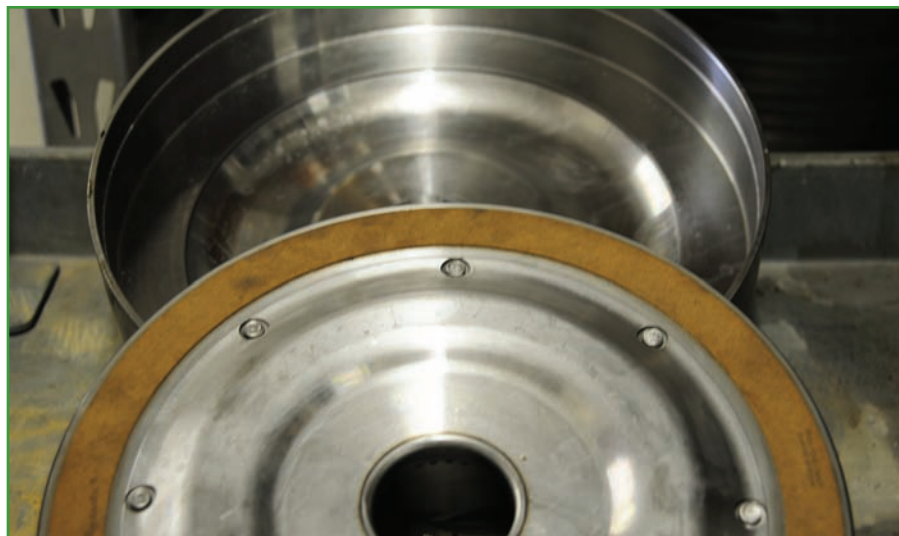


Figure 1

Both are valid concerns when purchasing replacement parts. But remember, your name is on that repair. And the quality of your work determines your reputation. Are you going to let your reputation depend on whether your supplier has a part in stock?

If your aftermarket source doesn't have the updated product, contact the dealer; they'll have it. I personally have never had an issue getting parts from my supplier when I needed them, so I almost have to wonder whether the first statement is true.

Cost is a different issue; I can understand why they're asking that question. But there's a real reason for going with the updated parts.

These late model 48RE trans-

missions are faced with some serious horsepower and turning torque. Let's face it: there's a lot of unused horsepower that can be accessed with aftermarket performance enhancers on the market today.

With that in mind, let's look at the facts: Converter clutch durability has been an issue from day one on these units. The extra horsepower places even greater load on these units. And today, to save fuel and put less wear and tear on the engine, lockup comes on sooner and more often.

When the computer signals for lockup, oil that was holding the torque converter clutch lining away from the cover is released through the input shaft and exhausted at the switch valve. This

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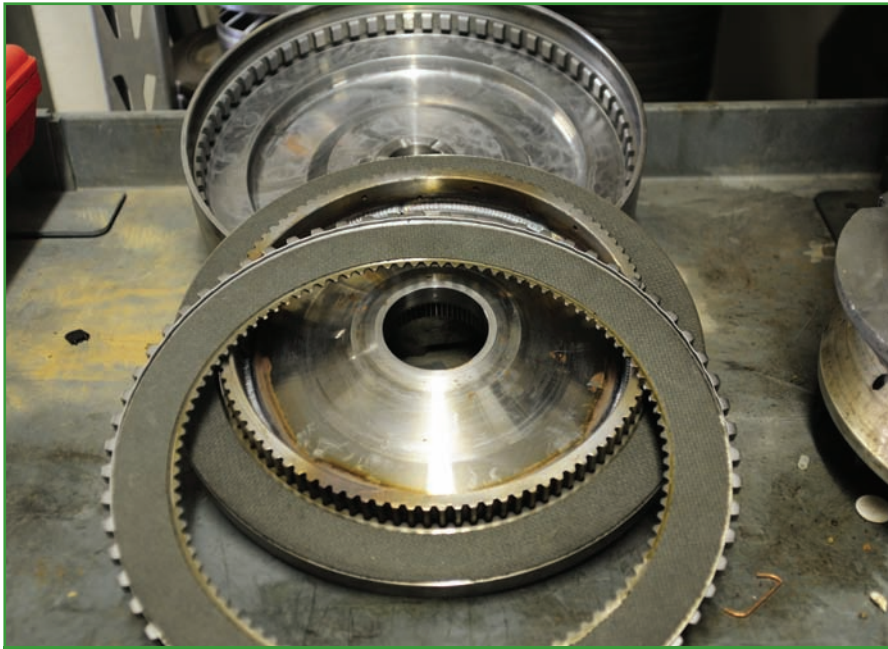


Figure 2

allows the pressure inside the converter to force the lockup clutch against the cover.

This internal converter pressure, in the original 42 through 47RE converters (figure 1), could be compromised with a leak between the converter hub and stator support assembly, allowing oil to be used/recycled through the pump gears. This leak reduced the pressure that was holding the clutch lining against the cover. This can, and often does, create a slip in the clutch lining, which eventually overheats and burns up the clutch.

The aftermarket came up with an excellent fix by going to what is called the *triple clutch lining* — two extra clutch surfaces to increase the holding area (figure 2). This makes the clutch more durable and improves clutch holding strength. Face it, the triple disk provides three times the holding area for the same amount of pressure inside the converter.

The triple clutch allowed for a greater holding force based on clutch lining surface area, even if we've lost some of the holding pressure due to leaks inside the converter. This durability upgrade is based on surface area alone.

Whenever there's a burnt clutch or band in any transmission, there are realistically only two likely causes (even though there are lots of variables within those two causes): Inadequate holding capacity or dragging.

When dealing with burnt converter clutch lining, these are the issues:

- Not enough pressure to sustain the load area, caused by leaks or excessive horsepower. The triple clutch provides more holding surface area with the same internal pressures. This creates a better chance of the lining holding, even under reduced pressures.
- The component is dragging when it's supposed to be released. This causes the clutch material to burn.

In the case of the earlier, single-disk OE converter, this low pressure prompted the upgrade to more surface area on the triple clutch disk (area #1). This low pressure issue needed to be

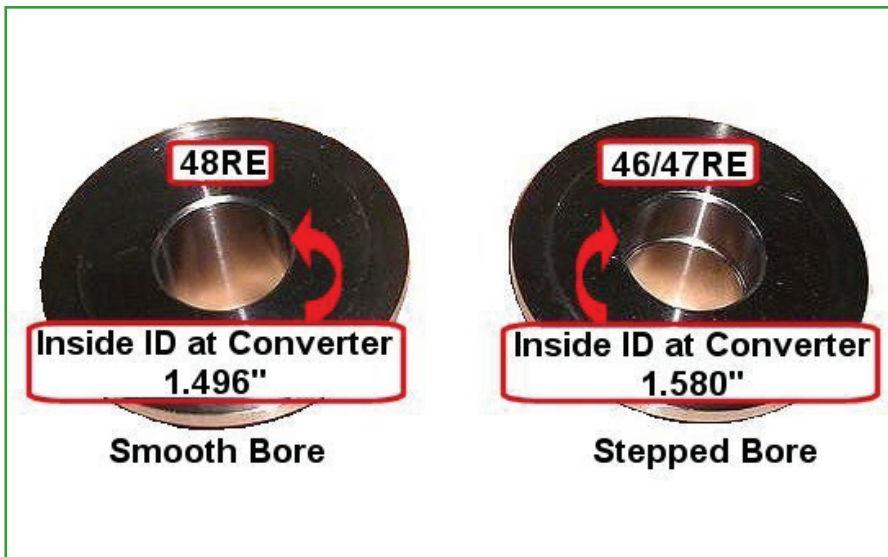


Figure 3A

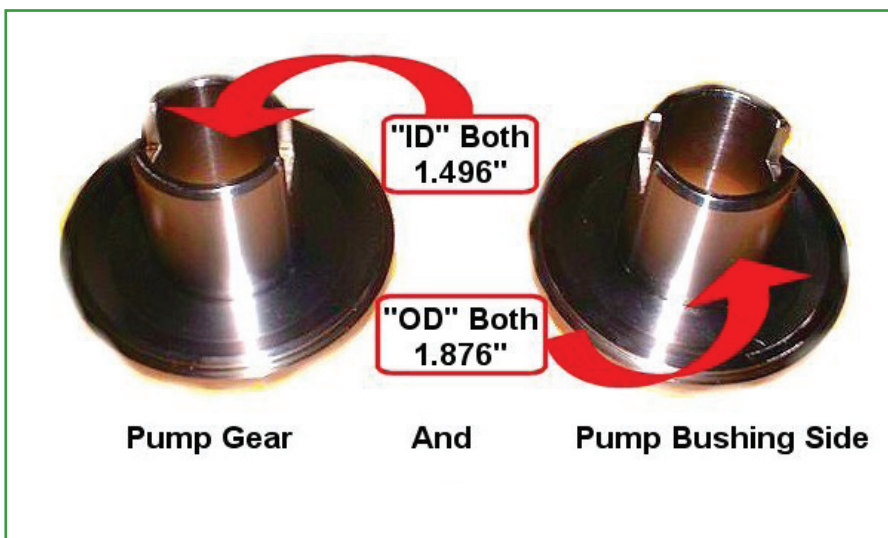


Figure 3B



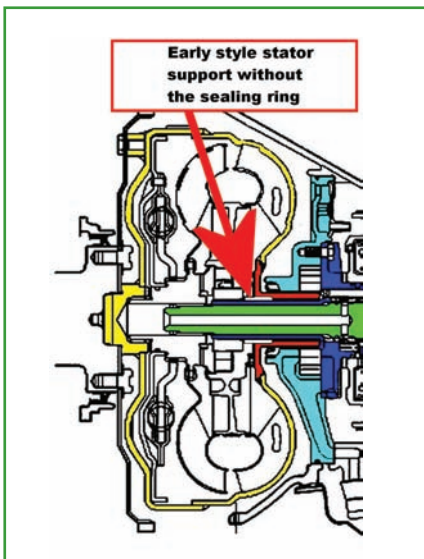


Figure 4

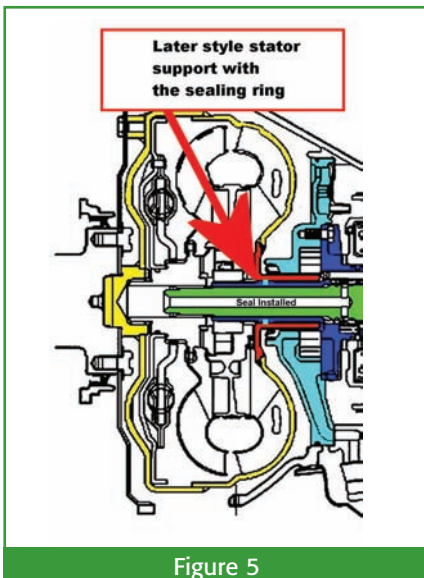


Figure 5

addressed within the stock OE single-disk unit, so when the 48RE series appeared around 2003 (when), provisions were made (why) to keep that pressure inside the torque converter.

To do this, the torque converter hub was redesigned (where), eliminating the lower step on the inside ID of the hub (figures 3a and 3b), allowing for a new seal ring on the stator support. This newer design helps keep pressure inside the torque converter when it goes into lockup.

This is where problems arose in the rebuild shop. Early on, when this change first showed up, many technicians weren't aware of the change to the torque converter hub ID (and some still don't know what was changed). The result was early-designed torque converters were installed with the improper ID surface on the hub.



Figure 6



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Figure 7

In doing this, the updated seal ring, installed on the stator support assembly, had nothing to seal against. This would cause the seal ring to blow out of the ring groove (figure 4) and end up where it could cause the entire transmission to burn down (inside the oil cooler, preventing lube flow).

Important: Always ID the replacement part to assure the proper fit.

This was a great update that helped

keep pressure inside the torque converter (figure 5) for a positive converter clutch engagement. So, referring back to the original question that I get on the tech line: Can you use earlier 46/47RE parts on the 48RE transmission (early-style torque converter and early style stator support assembly; figure 6)? Because of the advantages of the upgrades, no, we don't recommend using the early parts on later unit when rebuilding the transmission.

This first question is sometimes followed up by: "I'm using the aftermarket triple clutch converter, so it shouldn't make any difference."

Well, if the question is "can it work?" then the answer is yes. But will it work as good as the updated design in keeping that pressure inside the converter? That answer would have to be no; keeping the pressure inside the converter is the update with the seal ring (figure 7). Early parts didn't have that provision, so holding strength will be reduced with lower pressure.

Sometimes we hear this follow-up comment: "My supplier tells me just to leave the seal ring off the stator support

(late model seal ring support) and the early converter hub will work."

This was a common suggestion before the late style hub could be purchased and installed by the converter rebuilder. Early on (mid-2003), before the converter rebuilders were able to get the proper converter hub, you could do this. It'll work, but not the way it's supposed to with the seal ring.

All the converter suppliers quickly caught the differences in the converter hub design, so the "I can't get the converter from the supplier" objections about proper product have been gone for many years now. Most converter rebuilders offer the triple clutch lining and have the correct converter hub to take full advantage of those advances, not only with the 46/47RE early units but also with the later 48RE.

Important: If you use the updated triple clutch, the engagement into lockup is noticeably more aggressive. Modifications that we made to earlier units can cause very aggressive TCC engagement. This condition is now a built-in complaint that can be caused with the upgrade. You may have heard:

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“that’s the feel of durability.”

Sound familiar? The feel of TCC engagement is controlled by the release oil exhausting at the switch valve. The more area in the exhaust passage at the switch valve, the faster it allows the oil to flow by, so the firmer the engagement.

Firm engagement doesn’t do anything if there isn’t enough pressure to sustain the load due to leaks in the system. My recommendation is to build this transmission as designed. If there’s a seal ring on the stator support assembly, use it. Just make sure the torque converter is built with the proper hub that allows that seal ring to do its job.

The triple disk converter is an excellent idea in the 48RE series, as long as the engagement isn’t too aggressive causing customer complaints.

The drawback to aggressive engagement (especially if there’s a performance kit installed with higher working line pressure) is that the stock input shaft can break (figure 8) because of the positive engagement. We recommend you upgrade to a billet input shaft to help prevent it from breaking

(remember the racer saying “you play; you pay”). When the input shaft breaks, typically it will also break the stator support, filling the unit with metal.

A couple years back I wrote a three-part article revolving around lockup issues. This was to help in understanding the mechanical, electrical, and hydraulic functions that allow the TCC to work. We hinted on the new design but I think, looking back, I must not have been clear on the positive results of keeping that pressure inside the converter.

Along with the updates for keeping the pressure inside the converter were pump and valve body updates for high pressure advances, so don’t mix up



Figure 8

pump parts such as gears or valve body parts; they were also redesigned with these changes for a reason.

So until next time, keep those transmissions in good shifting health!

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