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Building a Reid Super Hydra 400 Transmission: Part 2

IN THE FIRST OF THIS TWO PART SERIES, we covered the Reid Super Hydra 400 case and what Jim Galatioto at ATO Performance was going to do with it for our build. In this installment, we cover Jim's build tips for success and why he does things the way he does. He has a reputation for building strong transmissions tuned to the needs of the customer. Spending time in his shop and watching him work made it obvious to me that his build philosophy translates into the highest quality finished product.

While this article is not going to teach you how to build a TH400, it's going to give you tips for doing any transmission work, specifically related to automatic transmissions.

We've put several hours on the car already and it's about to go south for shock tuning. The transmission has worked flawlessly and is inspiring confidence.

Let's go through a variety of things Jim does to make our confidence a reality.

RESOURCES:

Reid Racing
www.reidracing.biz

ATO Performance
www.atotransmissions.com

Continental Torque Converters
www.ctconverters.com


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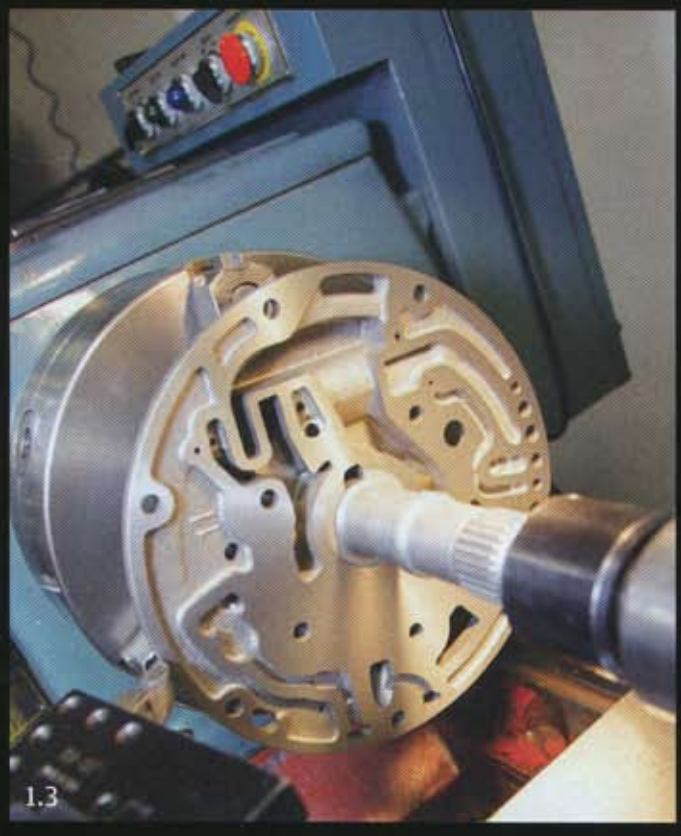
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1.1 Jim has to have it clean. Looking around his build area you see that everything has its place and that includes parts, tools, and the people working in the area. Plenty of light to see what you're doing makes the work that much easier. In order to keep outdoor contaminants out, the building does not bring air in from the outside. It can be warm in the summer, but it's clean.

1.2 Working on the "dirty" side of the shop is still clean. Look at the floor and there is nothing there but gray floor coating. Running the shop vacuum while milling ensures that most of the crud won't end up anywhere near your transmission.

1.3 Here is half of our freshly milled pump. Notice the lathe underneath is almost spotless. The pump will now be blown out and Jim will be certain nothing is left inside it but air.

1.4 Speaking of milling, note the spacer between the bottom of the Lokar dipstick and the retaining nut. Dennis from Reid milled this so there would be minimal interference and a solid connection when the nut went on to secure the dipstick. Because the Reid case walls are a little thicker, the Lokar piece didn't want to turn and thread into place. A few minutes work in Jim's very well equipped shop and the fix was in.

1.5 Assembly lube is as critical with transmission as it is with engines. Jim uses a product that dissolves in ATF at regular operating temperature but stays sticky and solid in shop temperatures up to about 135 degrees Fahrenheit.


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1.6 The lube goes on seals to make sure they slide right into position and also offer an airtight fit when he tests the transmission function with air.

1.7 Jim likes to build a transmission "dry" - meaning without any more fluid than is needed to provide initial lubrication. Doing this he can apply shop air to the various components to make sure they work before filling the unit with ATF and installing in the vehicle. It's far easier to diagnose a possible mistake in assembly of a failed component while the unit is sitting on your nice clean bench. This also ensures that a visual check is possible; allowing the builder to know that something is working as designed.

1.8 Here's an example of when supplying some lubrication during construction will help the part function when it's first installed in the vehicle. The pump rotor has very tight tolerances and the lube will help keep them that way until it's fully bathed in ATF.

1.9 With the bearing below and a thrust washer above, Jim shows us the difference between the two. Wherever possible, Jim replaces washers with bearings. The bearings provide a longer lasting and freer moving surface that generates less heat. Thrust washers tend to wear by slowly sloughing off material and tend to generate more heat which is the number one enemy of an auto transmission.

1.10 A close-up shot of the bearing and a how it looks. This bearing has far less friction than a thrust washer that relies on wear to support the component opposite of it.

1.11 Component differences can be seen here in the shift from a standard TH400 pressure plate to the Reid unit which is a full circumference billet steel piece that fully engages all the ribs in the SH400 case. These things you can't see make all the difference inside.


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1.12 The cork gasket is preferred for sealing the pan to the trans. As long as the pan is flat on the sealing edge the cork will work fine. Work your way around the pan with a small hammer and make sure all the uneven spots are made flat. Also, don't use any RTV or gasket maker as the excess can come off on the inside and potentially cause problems.

1.13 Torque your pan bolts down snug, but evenly. This keeps the pan in shape and avoids leaks. Derek at Trent Fabrication specifies a pressed steel pan in his cars so that if, in an unfortunate incident, the pan gets smacked, it will bend versus breaking, the likely outcome with a cast aluminum pan. Jim also added a drain plug to this pan so we can more readily take care of maintenance.

1.14 Many people that add larger, deeper pans are really looking for increased capacity. This can also be achieved by adding a significant cooler like this one from CBR. With its own fan and a large capacity, the trans fluid remains at a temp that works for racing and without over-stressing the transmission.

1.15 Another recommendation from Jim is on fluid choice. While he prefers the non-synthetic Chevron Drive Train HD 10 weight, he also recommends a synthetic Amsoil when the first is not available. Since the Chevron product is a Cat TO-4 spec and Caterpillar's TDTO 10 weight fluid was available in Reno, we got it. Our main concern was being able to use a conventional base oil product so we could add standard ATF if needed in the field. Available in five gallon pails, the quantity was right and the price was too, at roughly $5 a quart. Compared to some "racing" fluids, this was a bargain.

1.16 Bench racing - one of the perks of the job is having your customers come by to tell you of their latest success.