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No Compromise Overdrives !

This page is to help our customers who have purchased a rebuild kit to rebuild their own TH400 using the same parts, techniques, and principles we use at Jake's Performance.

We are in the construction phase on this page (and a bunch of others) but are posting some pertinent info to help our customers.

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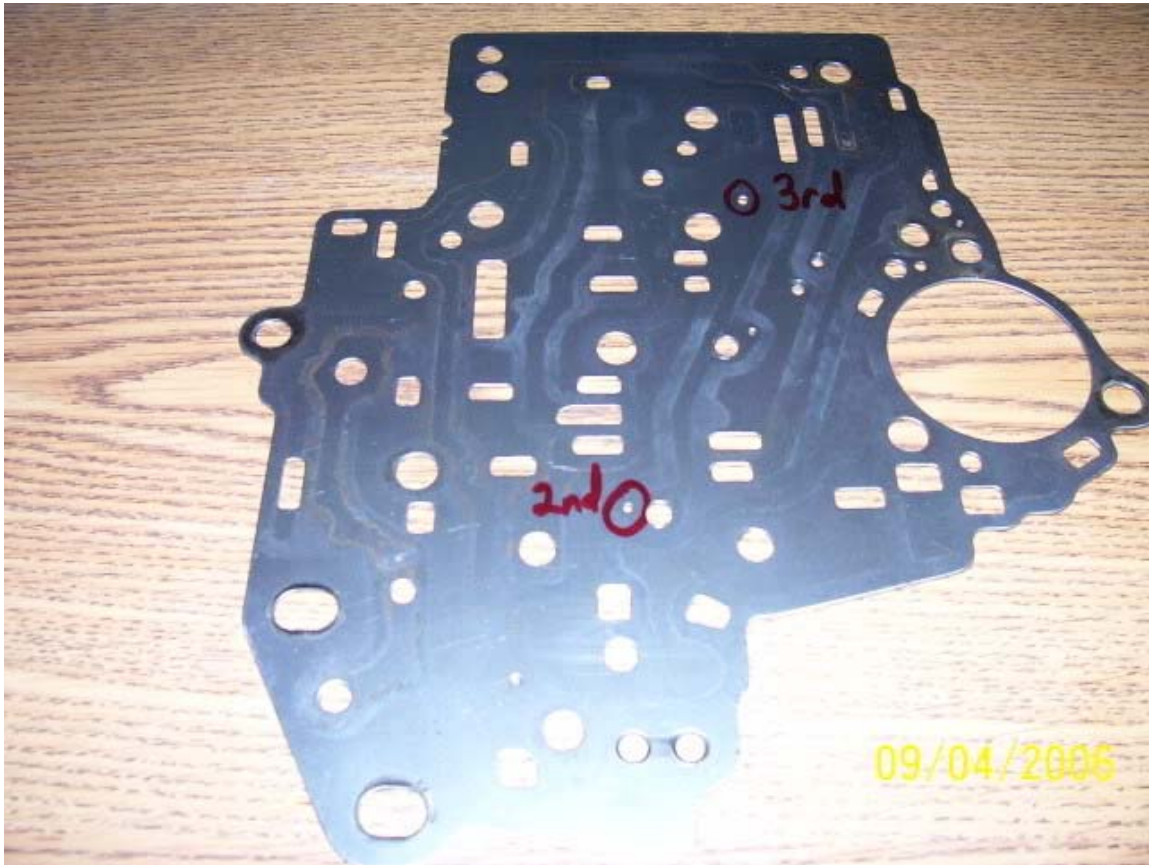
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DO NOT DO THESE MODS IF USING AN AFTERMARKET VALVE BODY SUCH AS A REVERSE PATTERN MANUAL OR TRANSBRAKE, FOLLOW THE INSTRUCTIONS PROVIDED WITH THE VALVE BODY!!!

Pictured below is a TH400 separator plate. The feed holes are marked. These holes can be drilled larger for firmer shifts.

Our maximum recommended sizing is .125" for the 2nd feed and .140" for the 3rd feed. This prevents 2nd gear sprag failure and overly harsh part throttle shifts. On milder units, you can go smaller for comfort.

A .090" 2nd feed and .110" 3rd while maintaining the accumulator is a good compromise for towing or near stock applications.



The photo below shows the set screw installed in the 3rd accumulator feed passage.

We recommend disassembling the 2-3 accumulator piston in the valve body (empty bore shown). Tapping the marked passage with a 5/16" tap and installing a 5/16 set screw.

You only need to tap the passage deep enough for the set screw to not protrude. This gives the set screw a place to tighten and seat.

You can omit the accumulator spring but you must re-install the piston. It becomes a travel limiter for the 2nd servo in the case.

This modification firms up the 2-3 shift, it will also affect the manual 1-2 shift.

We do this on most of our performance TH400 builds, however on 4x4 applications we typically leave the 3rd accumulator fully functional to prevent undue stress on the transfer case.



Shown below is the manual low control modification.

The 1-2 shift valve train is shown. Remove the roll pin in the end of the valve body, carefully remove the 1-2 valvetrain. A couple of awls or pocket screwdrivers are helpful. Pry the 1-2 shift valve (innermost or right side valve as seen in pic below.). It will help push the shift valve sleeve out of the bore.

Once you get it all out, you want to grind two flats on the 1-2 shift valve as seen in the pic, on the land marked with the arrow. Deburr any edges left from grinding.

There are several methods to plug the exhaust hole seen on the valve body. Shown is a checkball driven into the valve body casting. This is an effective method but care must be taken not to damage the valve body.

You must first drill the hole to 7/32" and it doesn't hurt to ream the hole a bit beyond that.

Reinstall the 1-2 shift valve in the bore to support the VB, now drive a checkball into the exhaust hole but don't drive it too far.

The key is that the 1-2 shift valve needs to be able to move freely in the bore.

Deburring the bore may be required after drilling and installing the checkball. A fine round file works well for this but don't get carried away.

You can also tap the hole and install a small set screw, or drive a cup plug in the hole if you can find a suitable size.

Once the 1-2 shift valve land has been ground, the exhaust hole plugged, and free movement of the 1-2 shift valve in its bore has been verified, reassemble the 1-2 shift valvetrain as it came apart.

You can now hold 1st gear to any speed or rpm, and you can also downshift to 1st from any speed. Be CAREFUL this mod has the potential to cause engine damage if you downshift from too high of a speed.



We typically retain 5 checkballs in the case for our automatic VB TH400s using the valve body modifications shown above.

They are shown here for reference. Some later cases (87-up) used an extra checkball. One checkball omitted is considered non-functional and left out on most stock rebuilds.



Our next bit of tech info is critical to the life of a TH400 used in anything over 450 HP.

It is referred to as the "dual feed modification".

It's purpose is to greatly increase the apply area of the direct (3rd) clutches.

It is a simple, almost free modification that is easily done during rebuild.

It requires removing the center seal from the direct drum. This is the only seal on the drum itself. You **MUST** retain both the inner and outer direct piston seals. The center seal separates the direct piston into two separate apply areas or chambers in the drum. By removing this seal you are making it one large apply area that yields much more apply pressure to the frictions.

The seal that needs to be removed is seen in the photo below. It is on the edge of the "stepped" area of the drum.



You can also remove the 2nd sealing ring on the center support. We prefer to do remove both the direct drum center seal and the center support second sealing ring. Technically you only have to remove one or the other to dual feed the clutches.

The center support sealing ring is shown below, notice the empty groove 2nd from the top.



Now that you have removed the seals you have created a pressure leak in 3rd gear. This must be corrected.

The oil fed to 3rd gear will travel through the drum and leak back out the reverse side of the center support, through the case and valve body and leak past the manual valve into the pan.

To correct the leak created by dual feeding, the reverse feed side of the center support must be plugged. That can be done in the center support itself by tapping the hole and installing a set screw or it can be done with a cup plug in the case at the reverse feed into the center support.

The reverse feed is the hole shown on the far right in the pic above. 3rd feed is the leftmost hole, and the center hole that is threaded is the 2nd feed.

We typically install a 3/8" cup plug into the case at the location shown below.



That covers the dual feed mod. It's as simple as leaving the two seals off and plugging a hole.

By doing this mod you have more than doubled the power capacity of your TH400.

We recommend blocking the 2-3 accumulator as shown above in combination with dual feeding.

Dual feeding uses a bit more fluid to apply the piston for 3rd gear. Our testing has shown us that this acts as a built in accumulator by preventing harsh shifts at part throttle and **EXTREMELY** positive shifts at WOT with moderately sized orificing in the plate (approx .140").

We have a small parts kit that includes the dual feed plugs and set screws for modifying the valve body.

The above mods will make your TH400 reliable without any further cost to you. We are sure you will like it.

Try it!

Give us a call to discuss your project!

940-458-5564

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