

# REBUILDER NEWS



Volume 5, Issue 2 / Second Quarter, 1998

from **TransTec**®

## There's Still Time to Enter...

## TransTec's 20th Anniversary "Head Out On The Highway" Give-Away

Transmission technicians have until October 1, 1998 to enter TransTec's "Head Out On The Highway" contest to win a new Harley-Davidson® Super Glide® motorcycle. The contest celebrates the company's 20th anniversary of supplying transmission professionals with rebuild kits.

No purchase is necessary, but you must be a professional transmission technician or shop owner to participate. Official entry forms can be found in

TransTec transmission kits with a date code of A98 to K98.

If you open a TransTec kit that doesn't contain an official entry form, you can still enter the contest. Simply fill out a postcard after reviewing contest rules presented in TransTec advertisements. You can also call TransTec's toll-free contest "hotline" at 1-800-852-0340 (ext. 6405) for contest information.

Look for the 20th anniversary "Head Out On The Highway" contest entry form the next time you open a TransTec kit. You may become the proud owner of a new Harley-Davidson Super-Glide. The drawing for the motorcycle will be held December 1, 1998.



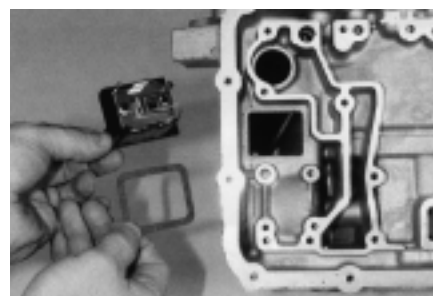
### In this issue...

- Our Troubleshooter article features Aisin Warner's 6040 - the "little brother" to the AW5040. *See page 3.*
- Win a Harley-Davidson® Super-Glide in TransTec's 20th anniversary "Head Out On The Highway" contest. *See cover article.*
- TransTec now offers the thermo element-to-case gasket for the CD4E 1993-Up. *See cover article.*
- Valve body gasket revisions made to the F4A-EL in 1996-Up Escort. *See page 2.*
- TransTec now offers the new "top hat" fill tube seal for 1997-up Chrysler RWD models. *See page 2.*
- Valve body gasket changes made to 1989-up ZF4HP22/24. *See back cover.*

### Thermo Element-to-Case Gasket for CD4E 1993-Up

TransTec is pleased to announce the availability of the gasket for the thermo element-to-case on the 1993-Up CD4E.

This gasket is not currently available separately from Ford dealers; you are still expected to purchase the complete element. This gasket, TransTec #12932, will be added to CD4E kits (overhaul kit # 2295) with date code C98 or later.



## Valve Body Gasket Revisions Made to F4A-EL in 1996-Up Escort

The F4A-EL unit found in 1996-Up Ford Escorts has had some minor valve body gasket revisions. The upper valve body separator plate gaskets now have a small orifice in place of the L-shaped slot. This change affects the upper valve body, both upper and lower gaskets. These new gaskets will be packaged loose in the main kit (TransTec Overhaul Kit No. 2265) with date code C97 or later.

Not to be outdone by Ford, Mazda

changed almost the entire set of gaskets for 1997-Up Protégé models. The main valve body gaskets and the upper valve body gaskets, as well as their mating separator plates, have been changed. Only the lower valve body gaskets have remained the same. As a result of this revision, a new sub-kit (TransTec No. 4861), which contains all the new gaskets for the Protégé, will be sub-packed within the kits (date code C97 or later).

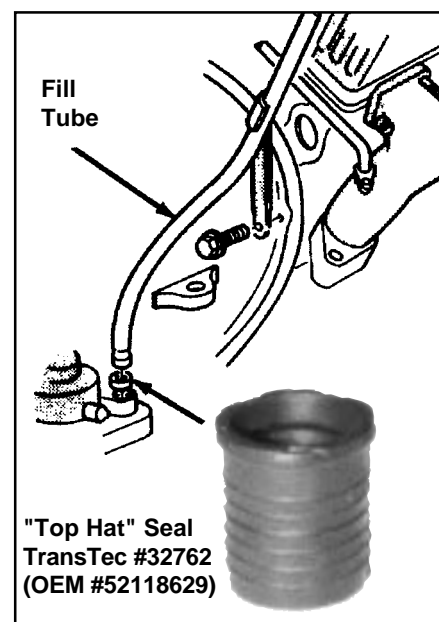
## Fill Tube Seal Now Available for 1997-Up Chrysler RWD Models

TransTec is pleased to announce the availability of a new "top hat" fill tube seal for the 1997-up Chrysler rear wheel drive models.

Chrysler has (finally!) followed Ford and GM's lead of nearly 20 years by switching from an O-ring to the boot-type seal in this application.

This new seal will be included in all TransTec gasket sets and overhaul kits for the A500, A518, and A618 with date codes of E98 or later.

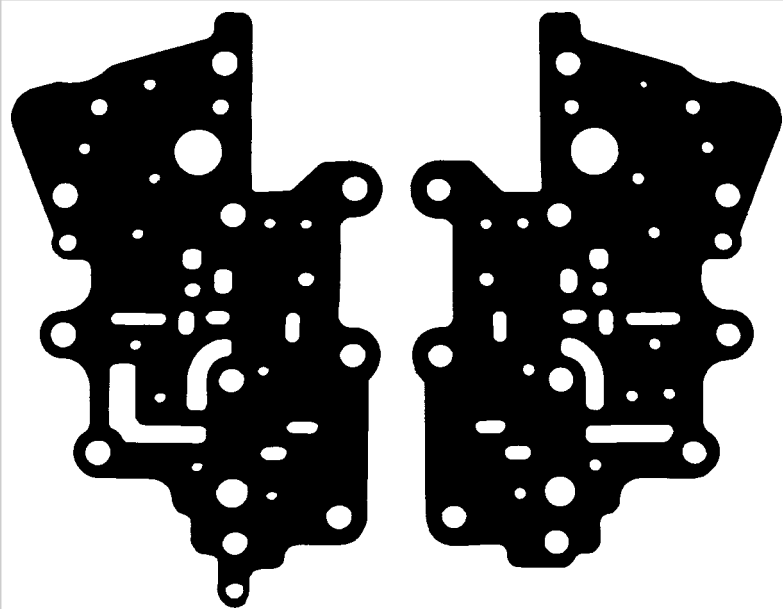
Late model A904s and A727s also use this boot. However, the seal will only be available in bulk sales for these units.



TransTechnical Bulletin

TransTec #12585  
1990-95

TransTec #12925  
1996-Up



(Note: Gaskets shown are for Ford applications.  
Upper gaskets shown; lower gaskets have similar modifications.)

REBUILDER

# NEWS

Denny Scher, Editor

Rebuilder News is dedicated to providing current technical information to the automatic transmission rebuilder. Reader's comments/suggestions are welcomed. Write: Editor, Rebuilder News, P.O. Box 556, Milan, Ohio 44846-0556, or e-mail: [dps@fngp.com](mailto:dps@fngp.com). All rights reserved. ©1998 Freudenberg-NOK General Partnership. Reproduction without prior written permission is prohibited.

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## Aisin Warner's 6040; Little brother to the 5040

By Tony Darr, Transmission Technician

The last issue of Rebuilder News addressed the introduction of Aisin Warner's "new" AW5040 unit and its slow, steady invasion of the domestic marketplace. In this issue we address the 5040's little brother, the AW6040. Now you may question why this smaller unit has a larger designation, and that indeed, is a good question.

### Maybe Bigger Isn't Better

The 6040 has four electronically-controlled forward speeds, a reverse gear and torque converter lock-up, the same as the 5040. Note that this all happens with one less clutch pack and one less sprag element, so maybe bigger is not always better!

Perhaps "6040" is the project number assigned by the engineers at Aisin Warner when it came time to create

front-drive transmissions for the masses. Then again, maybe the larger unit came before the smaller one. Think about the A904 and the A727, when was the last time you saw a 904 behind a 440 Magnum engine?

### They're Already Here...

The 6040 made its debut in the 1995 Suzuki Esteem, introduced in the states by Suzuki Motors to compete with compact cars like the Toyota Corolla, Nissan Sentra and Mazda Protege. Yes, that means there are a few of these cars running around as you're reading this. It must be a pretty good seller, since Suzuki's introducing a station wagon model in 1998 as well! Anyway, this transmission has been tooling around England in various Opel models since at least 1992. It can also be found "down under" in select Holdens, Daihatsus and Suzukis!

### More Info's Available

Unlike the 5040, the 6040 is not

likely to be found behind high torque V-6's and inline fives, although it has been coupled to a turbo-charged four banger in the UK. Consider yourself lucky when it comes time to repair one of these units. There is much more information available for the 6040 than the 5040. The Suzuki service manual is a very good source to start with, unless you have an Opel version. *The Opel version has only a few variations, most of which are in the valve body.*

This AW6040's clutch and band application strategy is very close to that of the 4L60, with the exception of the coast clutch being applied in all ranges except fourth gear. This makes diagnosis relatively easy, even if you don't have access to any type of service information.

The applied elements chart below includes the shift solenoid firing sequence. If this unit fails due to any one of its eight electronic signal components going out of whack, the "O/D Off" indicator lamp is its way of

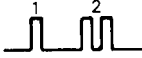



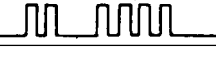
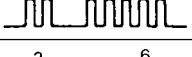
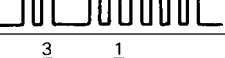
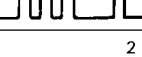
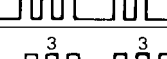
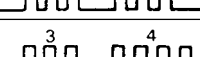
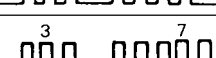
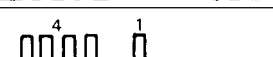


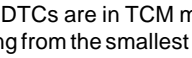
### Resistance Chart

Component	Resistance (Ω)
Vehicle Speed Sensor (Output Speed Sensor)	648 - 792
Input Speed Sensor	387 - 473
Shift Solenoids	11 - 15
Pressure Control Solenoid	3.3 - 3.7

### APPLIED ELEMENTS

		● : On    — : Off    □ : On only when TCC is operating										
Selector position	Part Gear Position	Solenoid valve No. 1	Solenoid valve No. 2	TCC control solenoid	Forward clutch	Reverse clutch	Coast clutch	Over-drive clutch	2nd/4th brake	1st/Reverse brake	Low Sprag	Forward Sprag
	P	●	-	-	-	-	●	-	-	-	-	-
	R	●	-	-	-	●	●	-	-	●	-	-
	N	●	-	-	-	-	●	-	-	-	-	-
D	1st	●	-	-	●	-	●	-	-	-	●	●
	2nd	●	●	-	●	-	●	-	●	-	-	●
	3rd	-	●	□	●	-	●	●	-	-	-	●
	4th (O/D)	-	-	□	●	-	-	●	●	-	-	-
2	1st	●	-	-	●	-	●	-	-	-	●	●
	2nd	●	●	-	●	-	●	-	●	-	-	●
L	1st	●	-	-	●	-	●	-	-	●	●	●

## Trouble Codes

No.	Mode	Diagnostic Area
12		*Issued at the start and end of diagnostics. When this code is output repeatedly, no other DTC is stored in TCM memory.
21		Circuit or solenoid shorted to B+ <b>Shift solenoid No. 1</b>
22		Circuit or solenoid shorted to ground
23		Circuit or solenoid shorted to B+ <b>Shift solenoid No. 2</b>
24		Circuit or solenoid shorted to ground
25		Circuit or solenoid shorted to B+ <b>TCC solenoid</b>
26		Circuit or solenoid shorted to ground
31		Vehicle speed sensor (output speed sensor)
32		Signal voltage low Throttle angle high <b>Throttle opening signal</b>
33		Signal voltage high Throttle angle low
34		Transmission range switch
37		Input speed sensor
41		Circuit or solenoid shorted to ground <b>Throttle pressure control solenoid</b>
42		Solenoid faulty or circuit shorted
51		Engine coolant temperature signal out of range

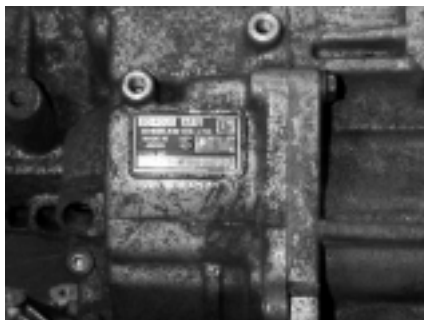
\*If any other DTCs are in TCM memory, this code is output first, followed by output of these DTCs, starting from the smallest code number in the increasing order, and they are repeated.

yelling for help. This light will flash a code 12 - a single flash, one-second pause, and then a double flash - at the beginning and end of trouble code retrieval. *Hmmmm, does this sound like GM to you?* A chart of trouble codes from the Suzuki service manual is included at right. This will at least start you in the right direction.

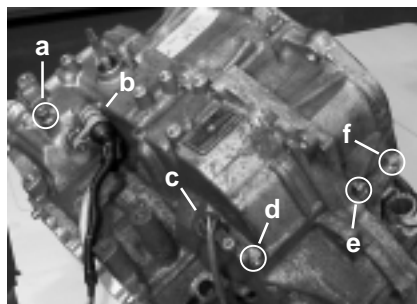
The core unit that was used for our initial research is of the Opel variety and is shown in the accompanying photos. Differences in the Suzuki version are called out. Just as with home loans and cellular phones, there's a lot of small print and details. Make note of what-and-where all the little pieces go. The following pictures show what we had to work with and are a good representation of what is out there. **YOUR UNIT MAY VARY ACCORDING TO MODEL CALIBRATION!**

### A Note of Thanks

I would like to take a moment to thank Lee Lucas at ATP A.T.R.S. England for his support and assistance in providing the transmission core, samples and information needed to make this project fly. I'll drink a warm beer just for you Lee! Also, a word of thanks goes to David Bond and Ken Wafstaff of ATP Australia, for the information they provided.

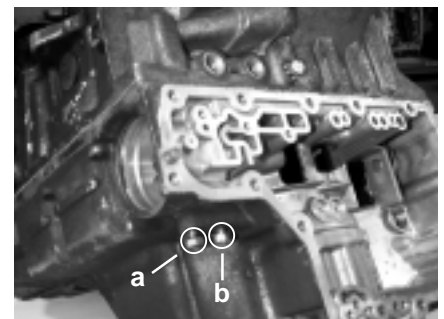


1) Provided no one else has trampled over this ground before you, Aisin was good enough to leave you this "map" to tell you what you've got.



2) Here's a "more than a mouthful" picture. Beginning from the left side and working right:

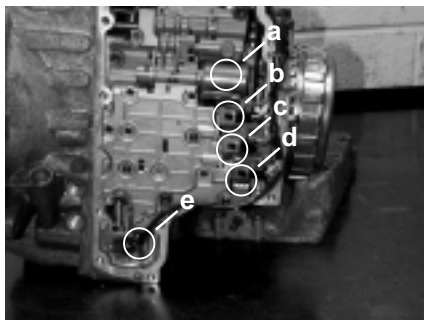
- a: valve body pressure (line)
- b: main electrical harness
- c: output speed sensor
- d/e/f: lube circuit



3) Air checking the 2-4 band servo is simple...

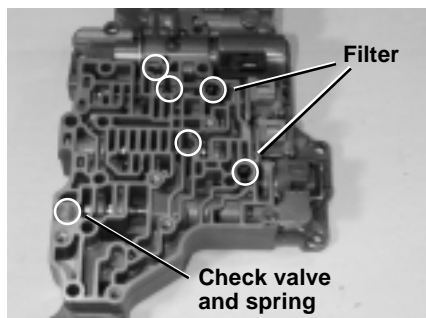
- a: servo apply port
- b: servo release port



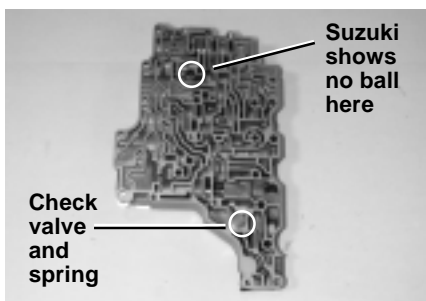


4) Here are the majority of the electrical components, starting at the top and working our way down.

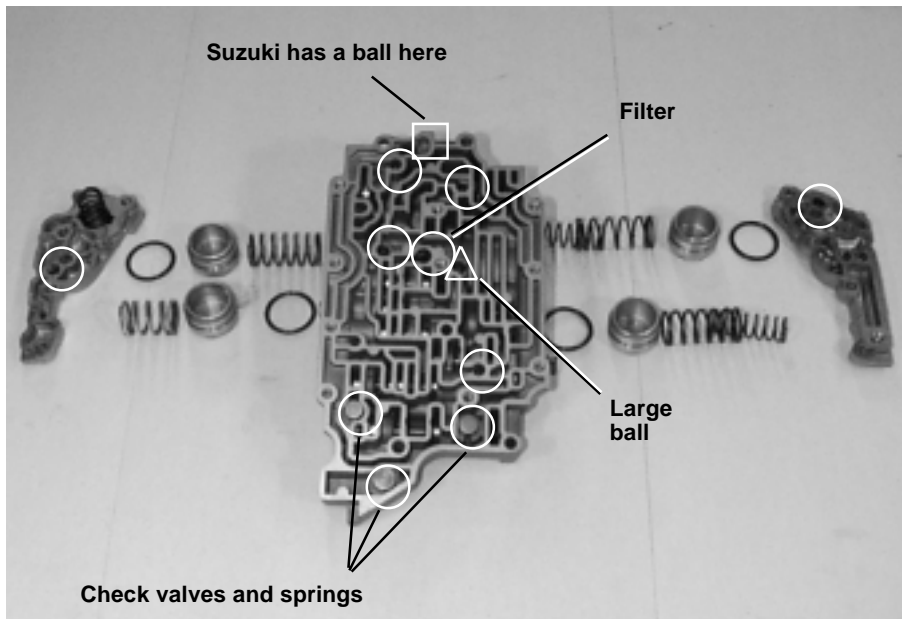
- a: throttle pressure control solenoid
- b: shift solenoid 1
- c: shift solenoid 2
- d: t.c.c. solenoid
- e: transmission temp sensor



5) This is under the aluminum (aluminium!) plate that covers the main valve body. There are three check balls, two filters and one check valve and spring. This appears to apply for both Opel and Suzuki applications.

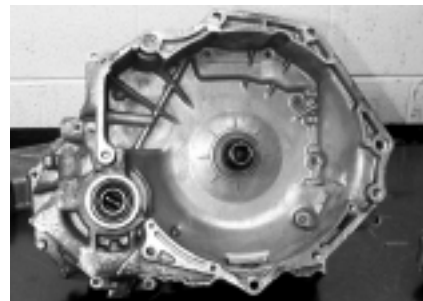


6) This is the front valve body, (main valve body) case side. Shown is the location of the check ball and the check valve and spring. Please note that this is from the Opel unit, the Suzuki information shows no check ball being used here. So the general disclaimer is that your unit may vary from what you see here.



7) This is the lower valve body and there is a lot of information to be found here. First note the check ball locations. Each accumulator cover has a check ball.

The cover closest to the converter housing also has a spring which acts upon the accumulator piston directly below it. The valve body itself has 5 check balls (Suzuki has 6 as shown with the box), one filter and three check valves and springs. Make a note of the one check ball that is a larger diameter than the rest, and is marked with a triangle. Unlike the 5040, this unit uses O-rings for the accumulator seals. All four are the same size; however, the pistons are not. The accumulator piston shown on the top left side has a shallower pocket than the rest. This was done to accommodate the spring residing in the cover. Once again, this is for general knowledge. Your unit may vary, so be cautious when opening this thing up!



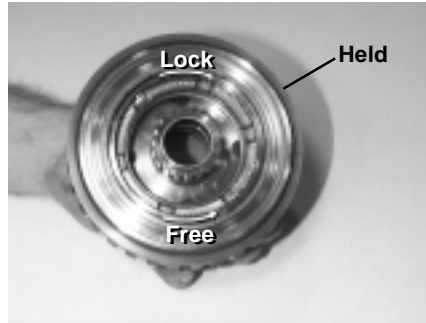
9) "Ok class, can anyone tell me where the pump is?"



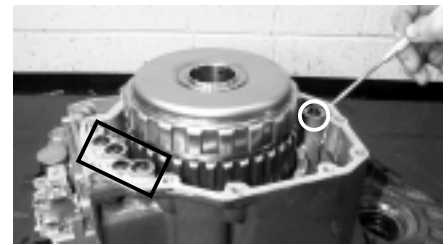
10) "That's right Jimmy, you must first remove the bellhousing half of the case to access the front pump!"



11) Here is the pump showing the O-ring used to seal the pump to the case. Also shown is the reverse clutch housing found directly behind the pump. Note there is no gasket between the pump and case. Make sure surfaces are clean and flat when you torque the pump in place (18 ft. lbs.).



15) This shows the low and reverse clutch hub which contains the low sprag. The sprag elements' inner race must lock and free wheel as shown by the arrows when the outer hub is held.



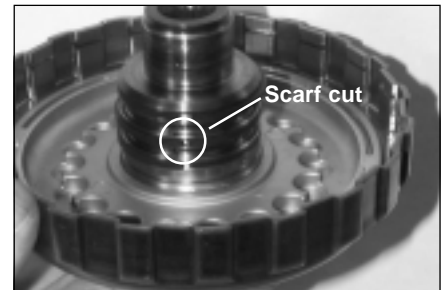
18) Here we go again with those bloody barrel seals! This unit has 3 different types and sizes for a total of 10 pieces per unit! Not even the 5040 has that many! Oh, by the way, there are no case or cover gaskets for this unit. Use a brand of RTV that you trust or use "Suzuki Bond No. 1216" part #99000-31160 and be careful how much you apply.



12) Here we see that those pesky little barrel seals also inhabit this Aisin unit as well! Only three of them are visible in this photo.



16) This must be a Mercedes trick - at least there aren't any rivets to chisel out! Inside the rear planetary ring gear assembly, hidden beneath the plate, is a molded rubber seal. This seal is for keeping lube oil around the sprag. Take a minute to look at this closely - the plate can and will go in either way. As we all know, only one way is right, so make sure the pocket for the bearing faces the ring gear and all will go well.



19) I want to draw your attention to the fact that the sealing rings on the forward clutch drum are not created equal. The upper and lower rings are butt cut teflon seals while the center seal is of the scarf cut variety. All three are the same size and material, so please don't get them mixed up!



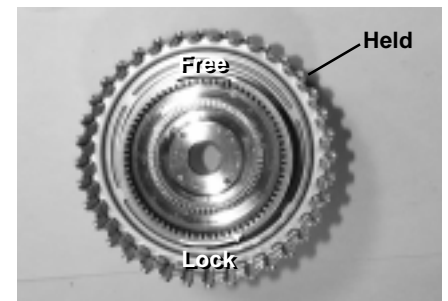
13) Can you remember doing your first A404 and losing the band anchor pin in the washing machine? I can! This thing will stick tight in the case until you really need it to, then you play hell trying to keep it in!



14) Unlike the A404, this unit has two more of those @\$%@ pins, which are for the parking pawl/manual linkage assembly.



17) Here we have the 2-4 band servo. Note the adjustment nut on the back side of the apply pin. Since this comes in from the bottom side of the case, servicing or adjusting the band is reasonably easy.



20) Here is the O/D and coast clutch housing. In the center of it is the rear planetary ring gear assembly. Why are we looking at this, you may ask? Because the forward sprag is also hiding in here! As shown, the element must free wheel and lock in the directions indicated by the arrows, while the drum is held.

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Harahan, LA	Tucker, GA
Houston, TX	VanNuys, CA
Livonia, MI	Yauco, PR

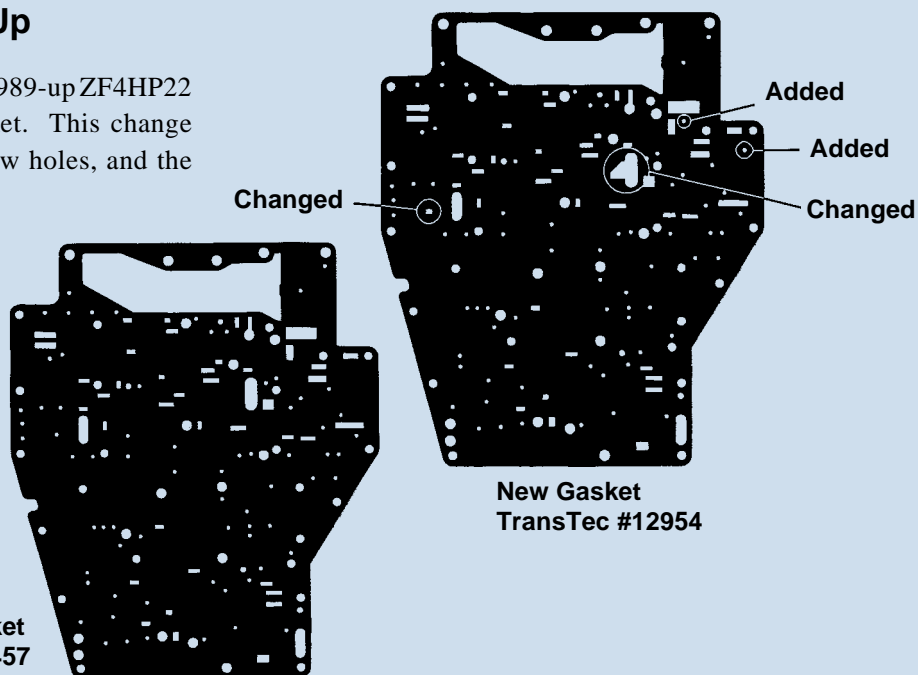
## T.P.S. Texarkana, TX

Little Rock, AR	Shreveport, LA
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## Valve Body Gasket Changes Made to ZF4HP22/24 1989-Up

There has been an update in the 1989-up ZF4HP22 and ZF4HP24 valve body gasket. This change involves the addition of two new holes, and the revision of two existing holes.

The new gasket, TransTec #12954 (OEM #1043-328080) will retrofit all previous 1989-up models and will be added to TransTec over-haul kit #2192 when stock of the previous part is depleted.



**TransTec**

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