2005

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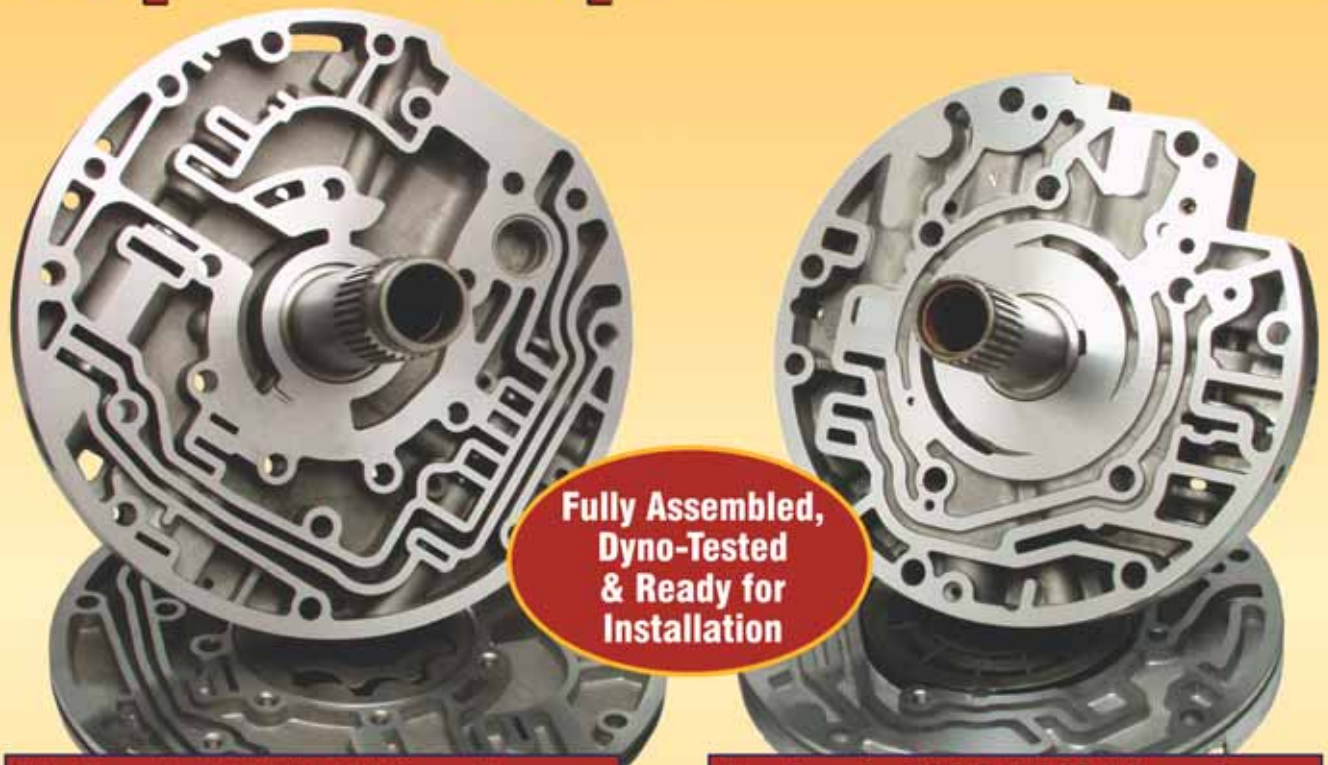

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This Super Pump features:

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AUTOMATIC TRANSMISSION REBUILDERS ASSOCIATION

The

Automatic Transmission Rebuilders Association

2400 Latigo Avenue
Oxnard, CA 93030

Phone: (805) 604-2000 Fax: (805) 604-2005
http://www.atra.com

This manual has been developed by the Automatic Transmission Rebuilders Association (ATRA) Technical Department to be used by qualified transmission technicians in conjunction with ATRA's technical seminars. Since the circumstances of its use are beyond ATRA's control, ATRA assumes no liability for the use of such information or any damages incurred through its use and application. Nothing contained in this manual is to be considered contractual or providing some form of warranty on the part of ATRA. No part of this program should be construed as recommending any procedure which is contrary to any vehicle manufacturer's recommendations. ATRA recommends only qualified transmission technicians perform the procedures in this manual.

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Dennis Madden
Chief Executive Officer

Welcome to the 2005 ATRA Technical Seminar!

This year marks another milestone in the evolution of the ATRA technical seminar. Because again the ATRA seminar manual has been developed and printed in full color!

Having worked on several seminar manuals myself I know what it takes to produce a seminar. Lance Wiggins and the ATRA Technical staff have really pulled out all the stops again; another sign of the new things coming out of the "New" ATRA.

This seminar, along with everything else at ATRA is a group effort, with a lot of effort in the background that nobody ever sees. I could not be more delighted with the staff here at ATRA.

ATRA is changing all the time: with the new items like the 3-year Golden Rule warranty, to give your customer that added peace of mind; point-of-sale items to make your shop look even more professional; Nation-wide advertising and referral services, getting more consumers into ATRA Members' shops. These are just a few of the changes you've seen in the past year, and it's only the beginning.

On behalf of the ATRA staff, and the ATRA Chapters that work so hard to bring you this seminar, welcome.

Sincerely,

Dennis Madden,

ATRA, CEO

Lance Wiggins
Technical Director

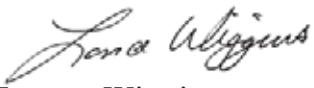
ATRA is proud to be celebrating another year serving the automatic transmission repair industry. A lot of changes have taken place over the last year and it's because of those changes that technical training has become an integral part of today's transmission repair industry. It's just not possible anymore to get by with a measure of common sense and a decent technical aptitude. To remain profitable, today's technicians need up-to-date training on an ongoing basis.

To that end, ATRA is pleased to present its 2005 Technical Seminar. Packed with countless hours of research and development, writing, editing, photography and layout, this year's seminar will stand out as one of the most demanding and useful technical training programs ever developed for this industry.

Once again, this year's technical manual has been produced in *full color*. With over 300 pages of up-to-the-minute technical information, the 2005 Technical Seminar Manual will remain a valuable resource long after the seminar is just a memory.

We're confident that you'll find this year's seminar presentation and technical manual both informative and profitable. In fact, we're so sure you'll be satisfied with what you learn in this program, we guarantee it!

So, on behalf of the entire ATRA staff, the international board of directors, and all of the ATRA members worldwide, we'd like to thank you for helping to make our over 50 years memorable.



Lance Wiggins
Technical Director

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Senior Technician and Seminar Speaker

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Spanish Technical Advisor

Shaun Velasquez
Web Designer

ATRA Staff

It's difficult enough getting the seminar book researched, written, pictured, edited, and printed let alone getting it out to the seminar attendees. This is where the ATRA Staff comes in.

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Without the ATRA team, it would be very hard to accomplish the task at hand. Please enjoy the seminar.

Lance Wiggins
ATRA, Technical Director

ATRA would like to thank the following companies for their continued support!

TRANStec®

Automatic Transmission Overhaul Kits

- The global leader in the automatic transmission rebuild kit market.
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- Currently servicing over 104 units, and cataloging 1,000 rebuild kit numbers.
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Gaskets:

Paper gaskets included in TransTec kits are manufactured by our Freudenberg-NOK Necedah plant (formerly known as Farnam). This QS-certified plant also supplies virtually all domestic OEMs with many of their paper gasket requirements used in automotive transmission and engine applications. Look for the TransTec name on these paper gaskets. It's your assurance of quality.

For applications using bonded valve body plates, we supply bonded gaskets with metal cores. You get the same OE-quality gaskets in TransTec overhaul kits that we supply to OEMs.

The manufacturing process used for our silicone beaded gaskets utilizes leading-edge technology to provide superior sealing.

Pan gaskets made of cork and rubber are high quality and manufactured by OE suppliers. Duraprene® fibrous material pan gaskets are also offered as an alternative for installer preference. Our molded rubber pan gaskets are formed around a plastic core for more stability; a proprietary process which Freudenberg-NOK developed for its current OEM customers. These gaskets feature torque-limiting inserts to help avoid over-torquing.

Bonded Pistons:

Bonded pistons are manufactured using a very precise molding process to create smooth, exacting rubber sealing surfaces bonded to metal pistons. Freudenberg was a pioneer in molding bonded pistons for European applications. NOK is the dominant supplier for Asian applications, and Freudenberg-NOK is an OE supplier of these domestically. The sealing surface of these pistons performs the same function as previous separate-seal designs, so bonded pistons should always be replaced during a rebuild.

Lip Seals:

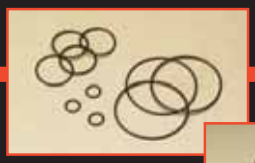
The majority of lip seals contained in TransTec kits are manufactured by Freudenberg-NOK plants and exclusive to our kits. We have supplied lip seals via the IPC group to automotive manufacturers for over 40 years. TransTec kits for import applications contain original NOK lip seals, a claim no other kit maker can make.

Sealing Rings:

TransTec kits use Freudenberg-NOK manufactured PTFE (Teflon®) rings. The QS-certified manufacturing plant is a pioneer in PTFE machined ring design. A machined ring involves a more exacting manufacturing process that results in components that seal better. With over 28 different compounds to choose from, complex formulas are used to ensure superior sealing in a broad range of sealing applications. In addition, TransTec is the aftermarket leader using state-of-the-art materials including Vespel®, PEEK™ and other synthetics. For applications requiring metal, we use only OEM-quality rings.

Metal Clad Seals:

Globally, Freudenberg-NOK manufactures more precision-molded radial shaft seals than all other manufacturers *combined*. TransTec alone has sold over 3 million NOK seals for *domestic* applications since they were first introduced in 1999. NOK brand oil seals are used exclusively in TransTec kits – no other transmission kits have them.



O-rings & D-rings:

The Freudenberg and NOK group companies manufacture O-rings and D-rings for automotive applications on a worldwide basis, an advantage we use to incorporate the OEM design, materials and resources of these seals into our kits.

It's What's Inside That Counts!

We're so confident in our world-class seals that we mold our initials into them. Look for these RMA (Rubber Manufacturers Association) codes on our seals.

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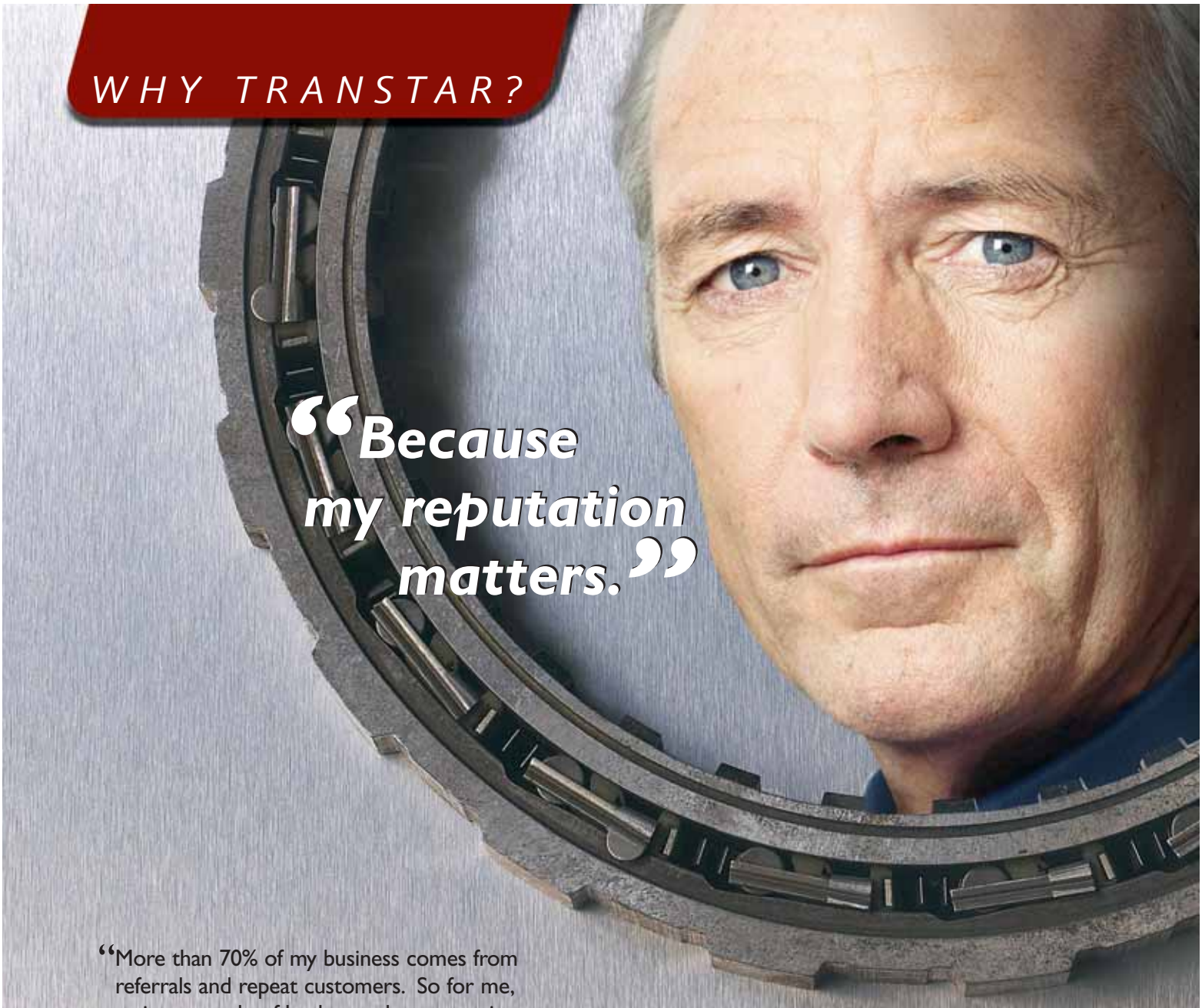

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Rostra

Solve problems. Stop comebacks.

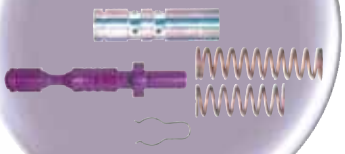
4T40-E
TCC Regulator Apply Valve Sleeve
FIXES NO TCC APPLY, SOFT OR SLIPPING APPLY

*33000-02

4T65-E
TCC Regulated Apply Valve
FIXES TCC SLIP, CODE 1870

*84754-34K

4L80-E
Actuator Feed Limit Valve Kit
FIXES WRONG GEAR STARTS, SOLENOID CODES, CLUTCH/BAND FAILURE



*34200-16K

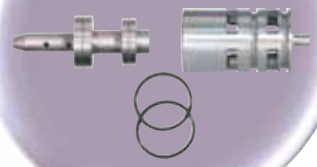
SATURN TAAT
Pressure Regulator Valve Sleeve and Separate OEM-Sized Valve
FIXES DELAYED OR HARSH REVERSE ENGAGEMENT AND HIGH LINE PRESSURE

*95200-05K
95200-06

4L80-E
Sure Cure® Kit
FIXES 2ND GEAR STARTS, NO 4TH, CODES 68, 85, 86, 87

SC-4L80E

4L80-E
Self-Regulating Reverse Boost Valve & Sleeve
PREVENTS BROKEN CASE, SERVO OR CLUTCH PISTON



34200-10K

4L60-E
TCC Regulator Valve Kits
FIXES 1870 SLIP CODE, LOW TCC APPLY PRESSURE

*77754-03K
*77754-04K

4L60-E
Actuator Feed Limit Valve Kit
FIXES WRONG GEAR STARTS, SOLENOID CODES, CLUTCH/BAND FAILURE

*77754-09K

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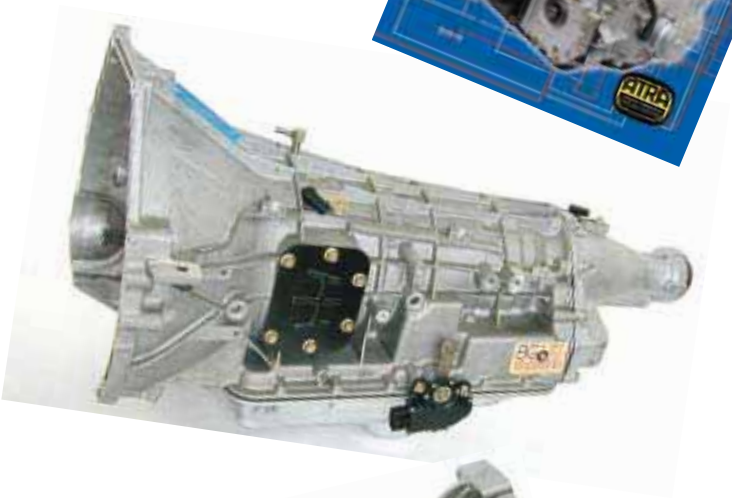
FORD Section



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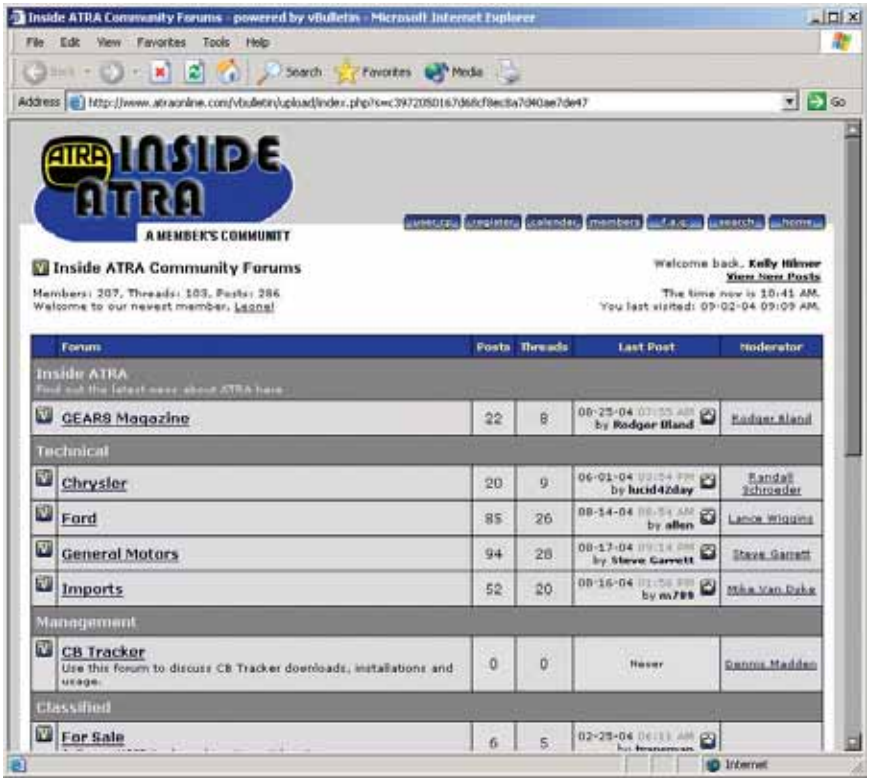

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The forums are available for anyone to view, however if you'd like to participate in the topics, you must be an ATRA Member.
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TorqShift

6.0L Diesel No Start, Misfire Codes

Vehicles equipped with the 6.0L engine may exhibit a no start or engine misfire codes. Multiple root causes can create these symptoms, including the Fuel Injection Control Module (FICM).

There are a couple of areas to look, at the wiring and the FICM. If the FICM is suspected to be the root cause, refer to the following procedure to verify the FICM is at fault before replacement.

NOTE: Verify the scanner has the latest level and the vehicle is updated to the latest calibration. Calibration issues and related Powertrain components can also cause this problem.

The most common symptoms of a failed FICM are a no start or multiple misfire codes that can not be removed. Diagnostic codes U0105 and/or P0611 may also be present. Symptoms other than these are not likely to be caused by the FICM.

If the FICM is replaced, it will not contain the necessary software. It must be programmed prior to use.

Check for FICM wiring harness for chafing. Perform a wiggle test to verify the integrity of the connections at the FICM and injectors. It's common to see DTC's P2614 and P2617 as a result of wire chafing. It is often necessary to push on the engine/injector harness to duplicate a ground out condition. Ensure the FICM connectors are fully seated. If any wire chafing is noted, repair as necessary and evaluate the vehicle. If the condition is corrected, return the vehicle to customer. If no wiring chafes are located proceed with the following pages.

NOTE: Some common chafing locations are:

1. ***The upper left valve cover***
2. ***Valve Cover Bolt areas***
3. ***Near the intake bolts***
4. ***Under and near the FICM***

TorqShift

6.0L Diesel No Start, Misfire Codes (continued)

Set up your scanner to test the FICM power and grounds by selecting these PIDS:
1. FICM_VPWR
2. FICM_LPWR
3. FICM_MPWR
4. B+

Monitor PIDS for the following values:

FICM_VPWR: FICM vehicle power from ignition switch voltage = battery voltage

FICM_ LPWR: FICM logic power from fuse, FICM relay voltage = battery voltage

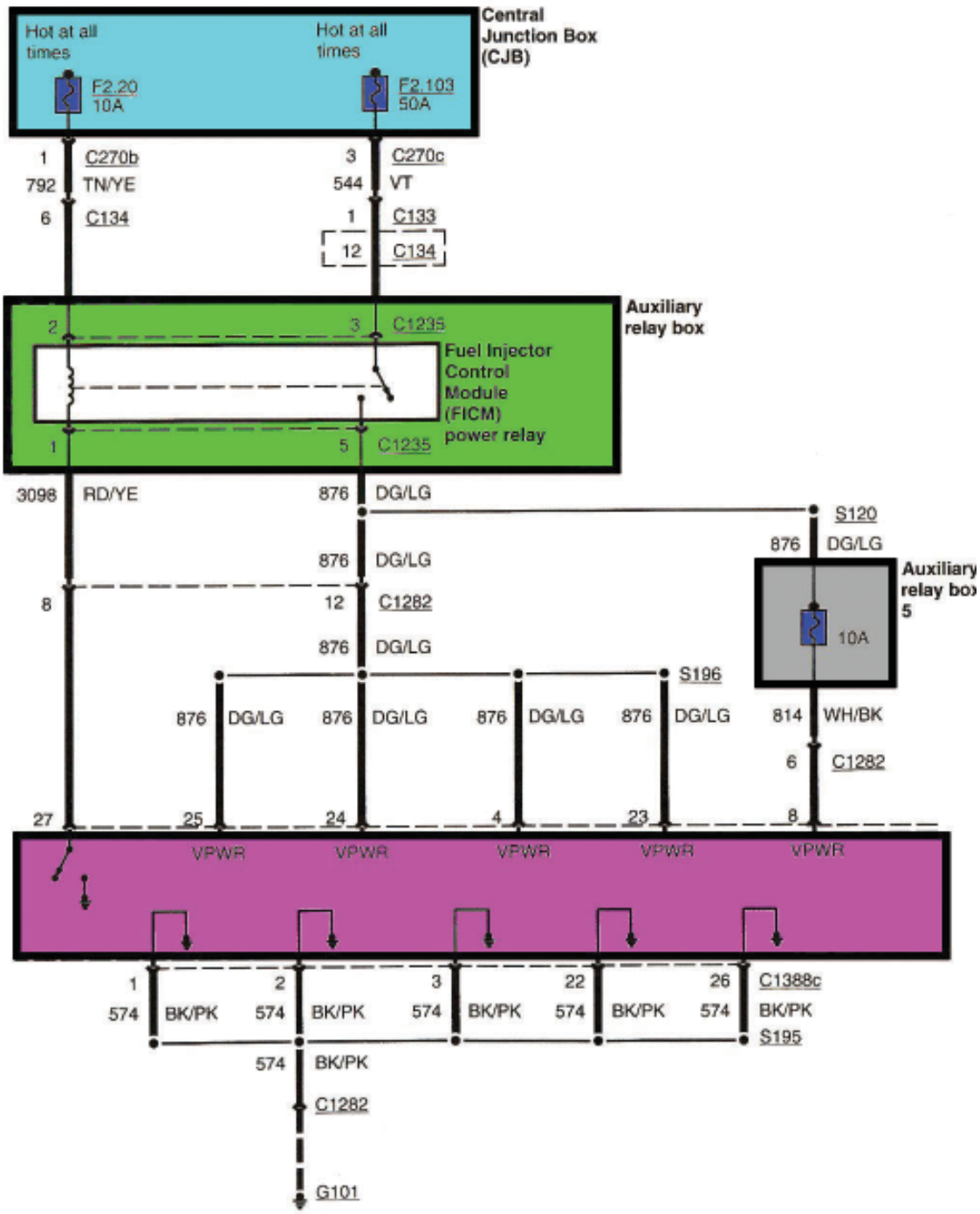
FICM_MPWR: Internal FICM power voltage = 47-50 volts

B+: Battery Voltage

If all of the above readings are within range, proceed with the following pages. If any of the above are out of range, disconnect the three FICM connectors and inspect condition of connector, pins, and wiring at the connector, paying close attention for wiring chafes. Repair any issues and evaluate the vehicle, if the condition is corrected return the vehicle to the customer.

TorqShift

6.0L Diesel No Start, Misfire Codes (continued)



TorqShift

6.0L Diesel No Start, Misfire Codes (continued)

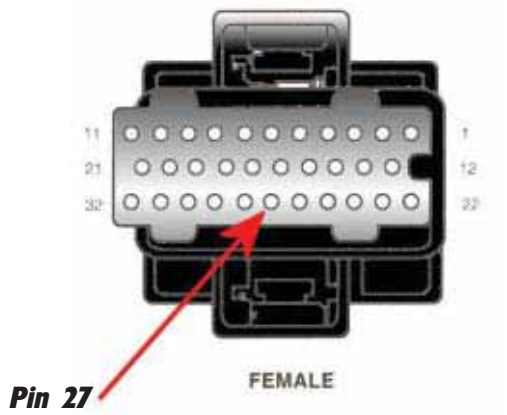
If the condition is still present use your voltmeter to check the following:

Check for B+ voltage at pin 27 of connector 1388c with the KOEO. If there is no voltage present, or low voltage is present, check circuit 3098 for a open. If B+ is present, jumper pin 27 of connector 1388c to a good battery ground.

Check for B+ voltage at pins 4, 7, 8, 23, 24, 25. If no or low voltage is found at any pin, repair as necessary.

If B+ is present at all pins, replace the FICM and return vehicle to customer.

NOTE: If the FICM is replaced it will not contain software, it must be programed prior to use.



PIN	Circuit	Circuit Function	PIN	Circuit	Circuit Function
1	574 (BK/PK)	Ground	17		Not Used
2	574 (BK/PK)	Ground	18		Not Used
3	574 (BK/PK)	Ground	19		Not Used
4	876 (DG/LG)	Fuel Injector Control Module (FICM) Power Relay, Switched Power	20		Not Used
5	54 (LG/YE)	Fuel Delivery Command	21		Not Used
6		Not Used	22	574 (BK/PK)	Ground
7	1717 (VT/OG)	Voltage Supplied in Start and Run (Overload Protection)	23	876 (DG/LG)	Fuel Injector Control Module (FICM) Power Relay, Switched Power
8	814 (WH/BK)	Fuel Injector Control Module (FICM) Power Relay, Switched Power, Fuse Feed	24	876 (DG/LG)	Fuel Injector Control Module (FICM) Power Relay, Switched Power
9	878 (PK/YE)	Powertrain Control systems, Communications	25	876 (DG/LG)	Fuel Injector Control Module (FICM) Power Relay, Switched Power
10	56 (DB/OG)	Cylinder Idenification	26	574 (BK/PK)	Ground
11		Not Used	27	3098 (RD/YE)	Fuel Injector Control Module (FICM) Power Relay, Control
12		Not Used	28		Not Used
13		Not Used	29		Not Used
14		Not Used	30	69 (RD/LG)	CAN Bus 2H
15		Not Used	31	70 (LB/WH)	CAN Bus 2L
16		Not Used	32	57 (BK)	Drain Wire

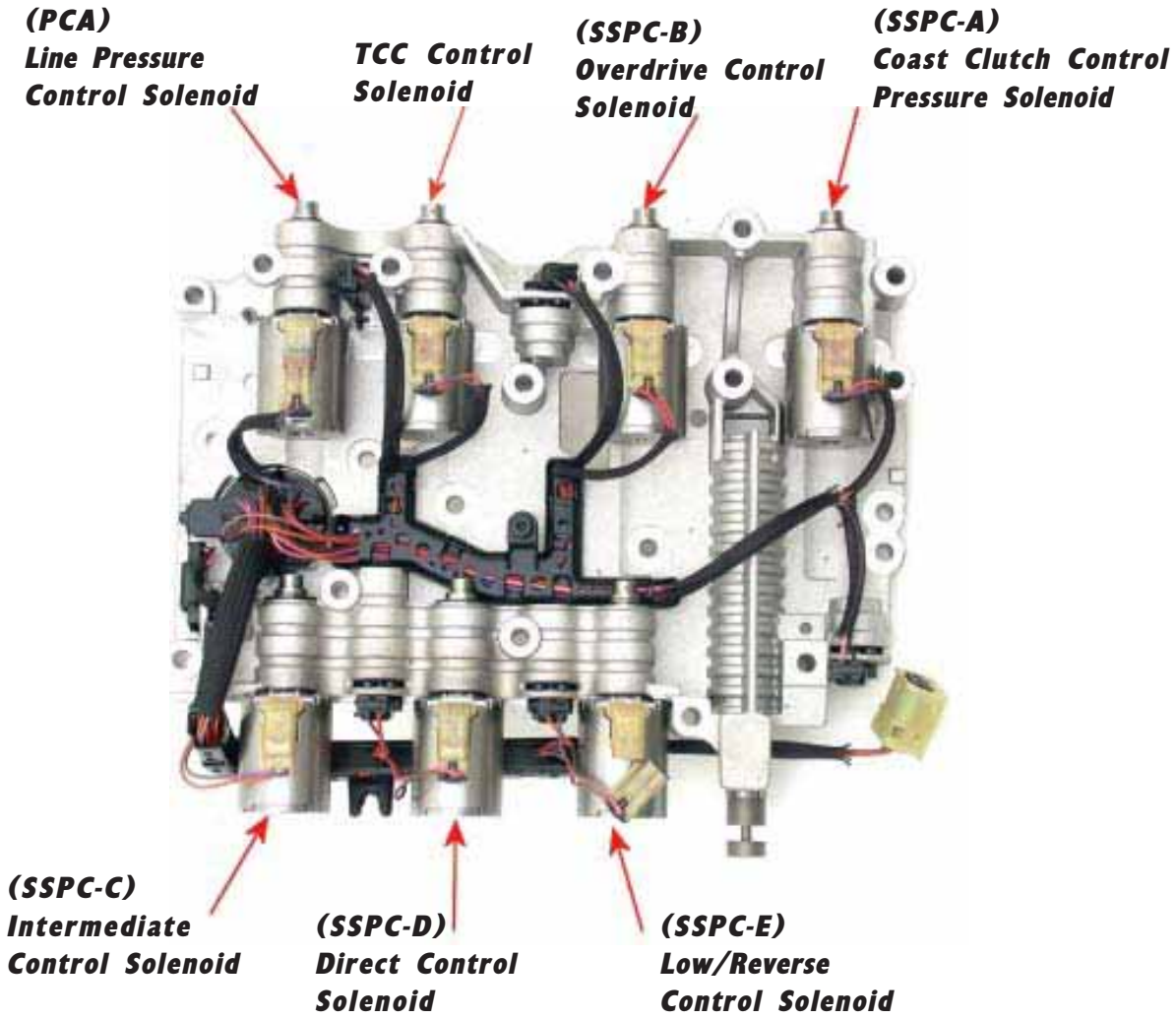
TorqShift

Erratic Line Pressure

Pressure Control Solenoid Failure

A failed solenoid can cause line pressure to bounce from 20 to 200 psi. Symptoms include erratic shift patterns, harsh shifts, soft shifts, flare shifts. The TorqShift transmission has a shift strategy system which allows the PCM to adjust the pressure of the transmission, allowing the transmission to shift the same way every time. To properly diagnose the solenoid, use your scanner and pressure gauge simultaneously. Compare the two reading to determine if the PCM is the cause or if the solenoid has failed.

(2)Two 3C3Z-7J136-AA (Coast and the Direct Clutch Solenoids)
(4)Four 3C3Z-7J136-BA (L/R, Intermediate, O/D, TCC Solenoids)
(1)One 4C3Z-7G383-AA (Line Pressure Control Solenoid)



TorqShift

Harsh Shifts Caused by the Wrong Fluid

Mercon SP ATF

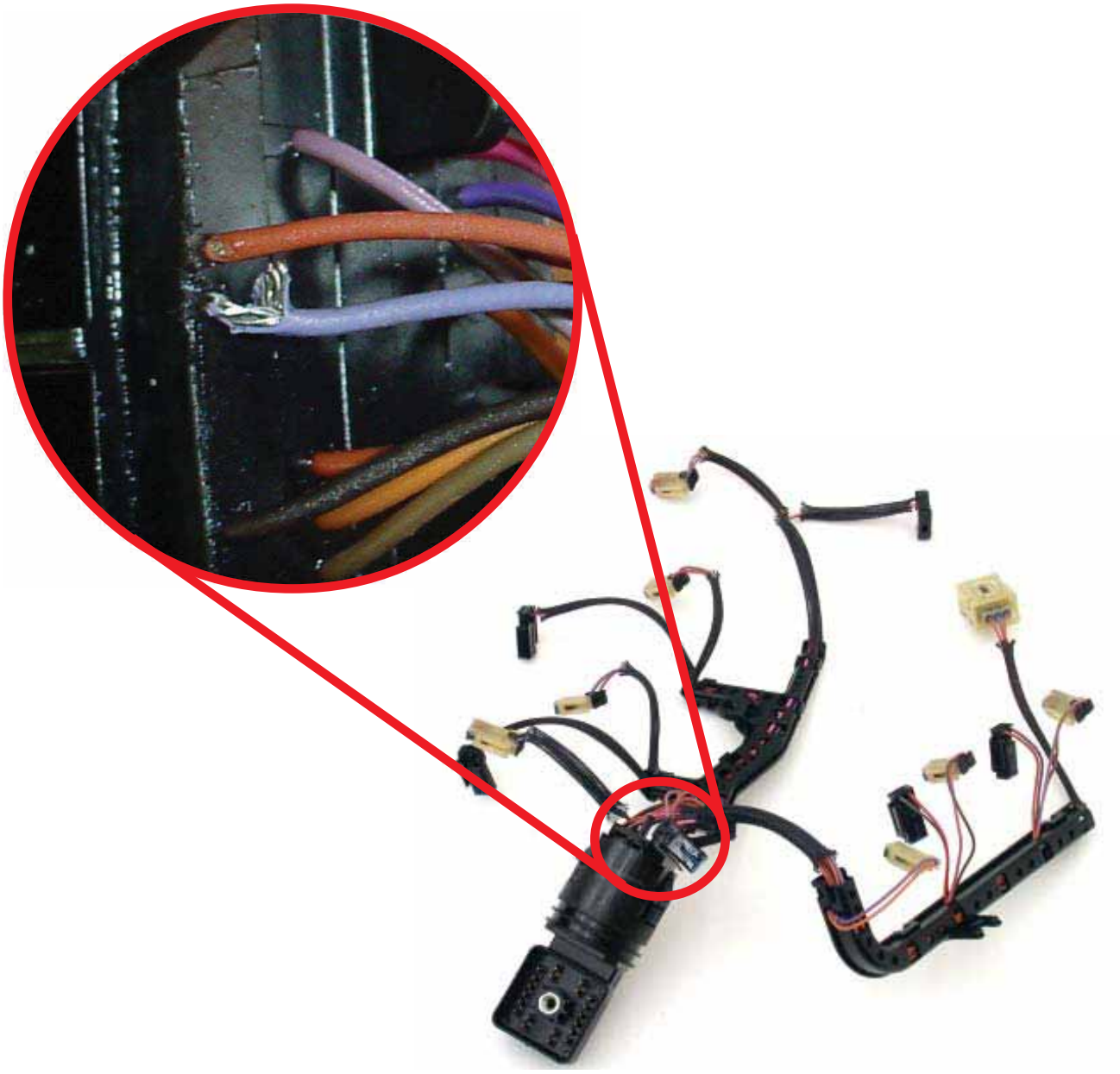
You must use Mercon SP ATF. Using Mercon V may cause harsh shifts, overheating, possible delayed engagements, and erratic shifts. These symptoms can be evident within the first test-drive.

TorqShift

Harsh Shifts

Solenoid Body Harness Damaged

Harsh shifts may be caused by the solenoid body harness being damaged. You may not see codes associated with this concern. Using your scanner, check the command from the PCM to the solenoid, if the PCM command to the solenoid is correct, remove the pan and check the solenoid harness.



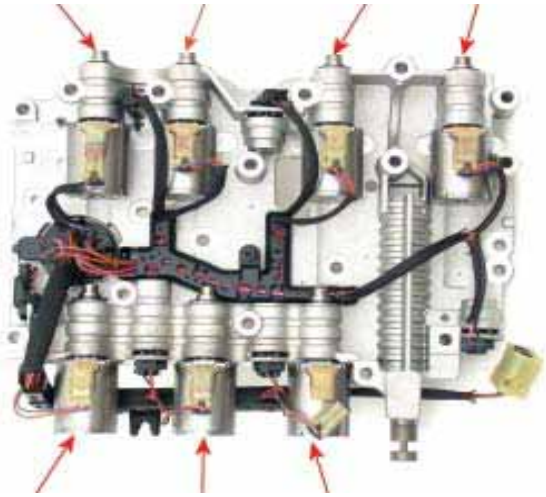
TorqShift

Internal Transmission Wiring Harness or Solenoid Body Replacement – Service Tip

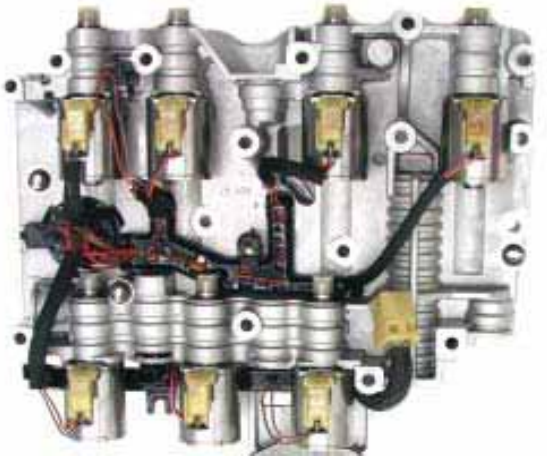
Super Duty F-Series or Excursion

The new solenoid harness does not have pressure switch connectors and is no longer required. The new harness supersedes all harnesses. A PCM reprogram is recommended.

Earlier Solenoid Body and Harness with Switches



Updated Solenoid Body and Harness without Switches



TorqShift

Harsh Disengagement When Shifting From Reverse to Park

2003 Super Duty F-Series or Excursion

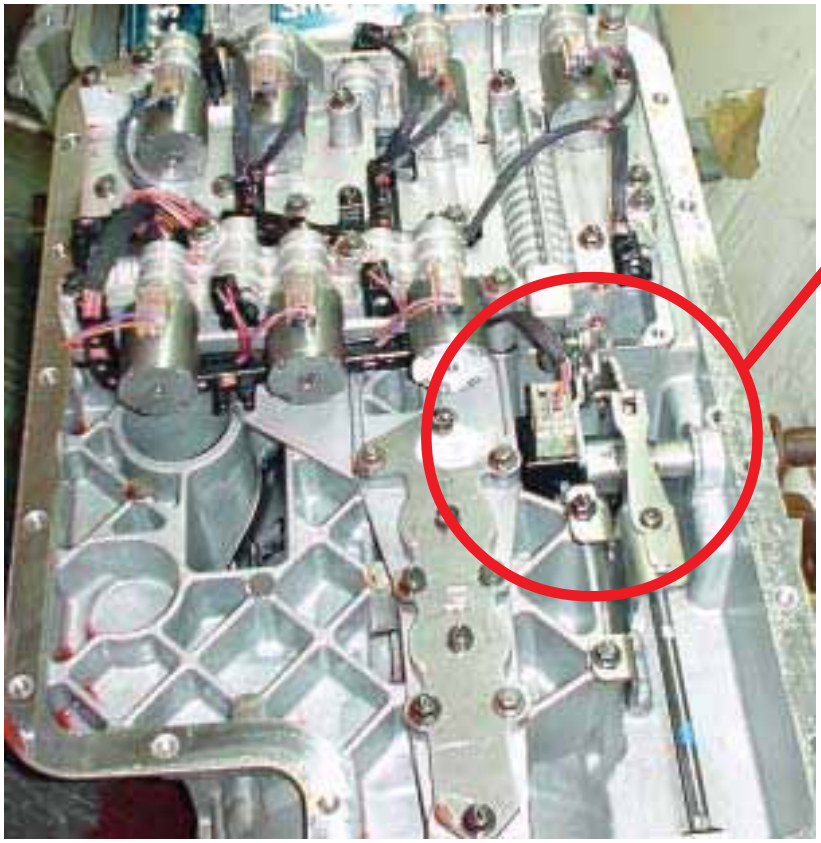
Some 2003-2004 Super Duty F-Series or Excursion vehicles built before 11/14/2003 with a 6.0L diesel engine and TorqShift transmission may exhibit a harsh disengagement when shifting from reverse to park. A clunk may also be heard during this disengagement. To correct this condition, replace the original solenoid body manual valve with a redesigned part 4C3Z-7D376-AA. To perform this repair, first remove the solenoid body assembly. Replace the manual valve with the redesigned valve. Use a new solenoid body-to-case gasket (3C3Z-7C155-DA) during reinstallation, clean and reuse the bottom pan gasket, and top off with Mercon SP transmission fluid.

Torqshift

No Crank/No Start with Low TR-P Voltage

2003 Super Duty F-Series or Excursion Equipped with 6.0L DIT

Some 2003-2004 Super Duty F-Series or Excursion vehicles equipped with a 6.0L DIT and Torqshift transmission may exhibit a no crank/no start. DTC's P1705 (TR circuit not indicating park/neutral during self test) P0706 (TR-P sensor frequency fault) and P0707 (TR-P sensor circuit duty cycle low input) may be present. If low voltage is found at the transmission range position sensor (TR-P) Pin 21 (3-4 volts) circuit 371, electrically disconnect the cooling fan clutch and retest the voltage. If the voltage now reads battery voltage and the vehicle cranks and starts, verify with a short test drive that the codes do not return. Do not service the transmission or replace the transmission range position sensor (TR-P) for this condition. Refer to the appropriate wiring diagram and service manual section to diagnose and service the cooling fan.



The Transmission Range Sensor is internal and located on the manual shaft.

E4OD/4R 100

Check Ball Identification and Symptom Chart

Repeated failures are caused by only two types of problems: parts or technique. If a *part* is causing the failure, it should be no surprise that using the same no-good part causes the same failure.
If the problem is *technique*, it means a process you are doing is actually *causing* the failure. An example would be drilling out a separator plate hole, changing the servo size, or leaving a checkball out. Sure, there are valid reasons for making modifications.

Checkballs are one of those *technique* issues: "yeah, leave that checkball out for a better 2-3 shift." We've all heard it, and we've all done it at one point or another, sometimes successfully, sometimes we're not so sure. But what we *can* be sure of is what those little checkballs do, and what effect leaving them out will have.

Early 1989 E4ODs...

The first E4OD had 16 checkballs.

Late 1989 E4ODs...

The second release of the E4OD was during the mid-year production. This change omitted CB3, CB4 and CB5. These are orificing checkballs for the intermediate, overdrive and direct accumulators. When these checkballs were omitted, so were the separator plate holes where they seated.
Leaving these checkballs out on an early 1989 model will cause a slide-bump during the shifts. Leaving the check balls in will cause no problem in late '89.

1990 – 1993 E4ODs...

In 1990, Ford omitted CB12 and BS5. BS5 was a shuttle for direct clutch oil and would shuttle between the direct clutch accumulator feed and engagement control valve feed. This ball didn't do anything in reverse, and wasn't needed for third because the engagement control valve blocked fluid flowing back through the system.
CB12 worked *with* BS5 in that it was part of the direct clutch feed circuit. It simply forced any oil on one side of BS5 to go through the engagement control valve during the apply, and then allowed for a quick drain of the circuit during release (reverse only).

E4OD/4R100

Check Ball Identification and Symptom Chart (continued)

1990 – 1993 E4ODs...(continued)

After the spearator plate hole for CB12 was eliminated, there was no more need for BS5. These two checkballs are a matched set; that is, it either has both or neither. If you install them on models that don't use them it's no big deal; they won't interfere with anything.

If you leave out the BS5 on models that require it, direct clutch oil will leak from the CB12 plate hole in third gear — regardless of whether you install the CB12 ball. When they eliminated CB12 they got rid of the hole in the plate for it. If your plate doesn't have a hole for CB12, leave both balls out (CB12 and BS5).

If you leave out CB12 on models that use it, it'll bypass the engagement control valve during reverse engagements, resulting in a *more aggressive engagement* in reverse.

1994 – 1995 E4ODs...

Some '94-'95 repair manuals labeled CB13 as CB12 in the hydraulics and in the check ball ID section. The function of this ball has always been the same. It's still the same ol' checkball in the lower valve body section that's been around since the beginning.

1996 – On E4ODs...

The changes in 1996 include two checkballs that were added (CB15 and CB16) and BS6 was moved from the case to the lower valve body. This change was to prime the low/reverse circuit in 1st gear, park and neutral.

Moving BS6 to the lower valve body put it near the SS2 (shift solenoid 2) circuit, so low/reverse clutch oil would dump when SS2 came on for the shift to 2nd. In addition, the 1-2 manual transition valve prevents SS2 oil from reaching the 1-2 shift valve until the low/reverse clutch is fully drained. CB16 is part of that circuit.

If you forget to install CB16, you may not realize it for a while. That's because it'll only leak low/reverse oil in manual low; reverse will be fine. BS6 was eliminated on some models and the reverse circuit to it was eliminated. But if you leave it out on models that use it, the transmission will shift 1-4, or in some cases (depending on condition of SS2) you'll get a 1-3-4 shift. Some models don't use BS6, but it won't cause any problem if you accidentally install it, because the hole in the separator is oblong, so the ball won't seal the hole. If the plate has two holes over the bath tub you must use a check ball in that location. If the plate has one hole, do not install a check ball.

E4OD/4R 100

Check Ball Identification and Symptom Chart

1996 – On E4ODs...

The CB15 is used in the exhaust circuit of the L/R modulator valve. The idea is that anytime you block off a regulator valve exhaust circuit it'll open fully to line (or whatever is feeding the circuit). So in park or neutral the L/R modulator valve primes the L/R clutch circuit, and CB15 allows the L/R modulator valve exhaust circuit to drain.

When you go to reverse, reverse oil begins to flow through the circuits, pushing CB15 into the L/R modulator valve exhaust, and BAM! — the low/reverse clutch applies. Applying the L/R clutch before the direct clutch in reverse makes for a much smoother apply. The L/R clutch will still apply if you leave out CB15, but not as quickly, so you may get a bang going from park to reverse.

The Rest of the Checkballs...

So far we've only talked about the checkballs that have changed over the years. Let's do a quick rundown on the ones that *haven't* changed:

CB1: Blocks manual 2 and L oil going to the 4-3-2 manual timing valve from leaking through the reverse circuit. Leave it out and it'll dump line oil out of the manual control valve.

CB6: Orificing checkball for the direct clutch exhaust. During a 3-2 kickdown it forces direct clutch oil to drain through an orifice, slowing the release. If you leave it out, you'll get a clunk on a 3-2 kickdown.

CB7: Orificing checkball for the overdrive clutch exhaust. During a 4-3 kickdown it forces overdrive clutch oil to drain through an orifice, slowing the release. If you leave it out, you'll get a clunk on a 4-3 kickdown.

CB8: Orificing checkball for the coast clutch apply. If you leave it out, you'll get a clunk when the coast clutch applies for engine braking.

CB9: Orificing checkball for intermediate servo apply. If you leave it out, the intermediate band will apply more aggressively during a manual 3-2 downshift.

CB14: Orificing checkball for intermediate clutch release. If you leave it out you'll get a clunk on the 2-1 kickdown.

E4OD/4R 1OO

Check Ball Identification and Symptom Chart

The Rest of the Checkballs...

BS1: Shuttles between reverse oil and manual 2/low oil to stroke the coast clutch shift valve. If you leave it out, line oil dumps through the manual control valve in all of these ranges... not to mention the coast clutch won't apply for engine braking, *except* in drive when you cancel OD.

BS2: Shuttles between SS2 oil and manual 2 oil to stroke the 1-2 shift valve and L/R modulator valve. If you leave it out, the transmission will shift from 1st to 4th. That is, when the computer commands 2nd it stays in 1st. When it commands 3rd, it goes to 4th (just like BS6 on 1996-98 model E4ODs). The problem is, if the SS2 is stuck off it'll cause the same thing, so be careful. One more thing, depending on the condition of SS2, and well it flows, you may get a 1-3-4 shift.

BS3: Shuttles between reverse/manual 2 oil and the coast clutch solenoid to stroke the coast clutch shift valve. If you leave it out, you won't have any engine braking when you cancel overdrive. You'll also lose engine braking in reverse, manual 2 and manual low, just like leaving out BS1.

E4OD/4R IOO

Check Ball Identification and Symptom Chart (continued)

All Checkball Locations For E4OD and 4R100						
Ball Location	**Early 1989**	**Late 1989**	**1990-93**	**1994-95**	**1996-on**	**4R100**
CB1	X	X	X	X	X	X
CB3	X	{1}				
CB4	X	{1}				
CB5	X	{1}				
CB6	X	X	X	X	X	X
CB7	X	X	X	X	X	X
CB8	X	X	X	X	X	X
CB9	X	X	X	X	X	X
CB12	X	X				
CB13	X	X	X {2}	X	X	X
CB14	X	X	X	X	X	X
CB15					X	X
CB16					X	X
BS1	X	X	X	X	X	X
BS2	X	X	X	X	X	X
BS3	X	X	X	X	X	X
BS5	X	X {3}				
BS6 {4}	X	X	X	X	X {5}	X {5}

{1} CB3, CB4, CB5 (See early '89 check ball location page) If the plate has seats for these check balls, a ball must be installed.
{2} Some '94-'95 manuals labeled CB13 as CB12 in the hydraulics and in the check ball ID section. The function of this ball has always been the same.
{3} 5/16 steel ball in late '89
{4} '89-'95-BS6 Check ball was located in the case. '96-on BS6 was moved to the upper Valve body. (Also see note #5)
{5} The BS6 check ball was deleted in some models. If the plate has two holes over the bath tub you must use a check ball in that location. If the plate has one hole, do not install a check ball.

E4OD/4R 100

Check Ball Identification and Symptom Chart (continued)

Common Complaint Associated to Missing or Damaged Check Balls		
Ball Location	**Comments**	**Complaint**
CB1		Low line in Manual 2 and L
CB3		1-2 Slide Bump
CB4		3-4 Slide Bump
CB5		2-3 Slide Bump
CB6		Harsh 3-2 kickdown
CB7		Harsh 4-3 Kickdown
CB8		Clunk when applying the coast clutch
CB9		Harsh manual 3-2 coastdown shift
CB12	1994-95	Aggressive forward engagement
CB13	Except '94-95	Aggressive forward engagement
CB14		Harsh 2-1 Kickdown
CB15	96-on	Bump into Reverse
CB16	96-on	Repeat Low/Reverse Clutch Failure
BS1		No Coast clutch apply. Low line in Reverse, Manual 2 &L. The coast clutch will work in Drive when you cancel OD
BS2		Shifts 1-4*
BS3		No coast clutch apply
BS5	89 only	Slips in third and fourth, Burnt Direct Clutch
BS6	1989-95	Low line in Reverse and Manual 2
BS6	1996-on some models	Low line in Reverse and Manual 2, Shifts 1-4*

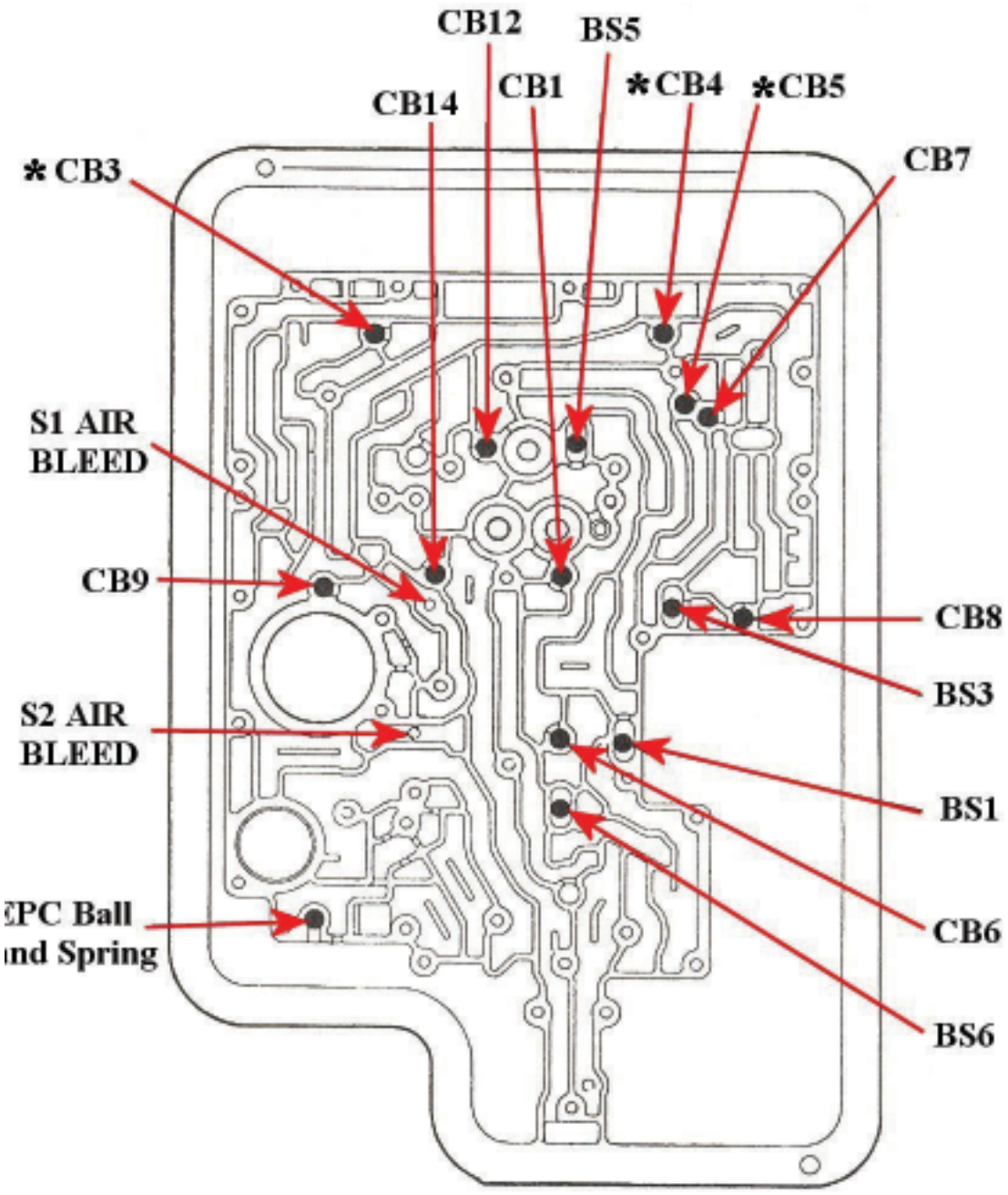
*Can shift 1-3-4 depending on the condition of SS2

E4OD/4R 100

Check Ball Identification and Symptom Chart (continued)

Early 1989

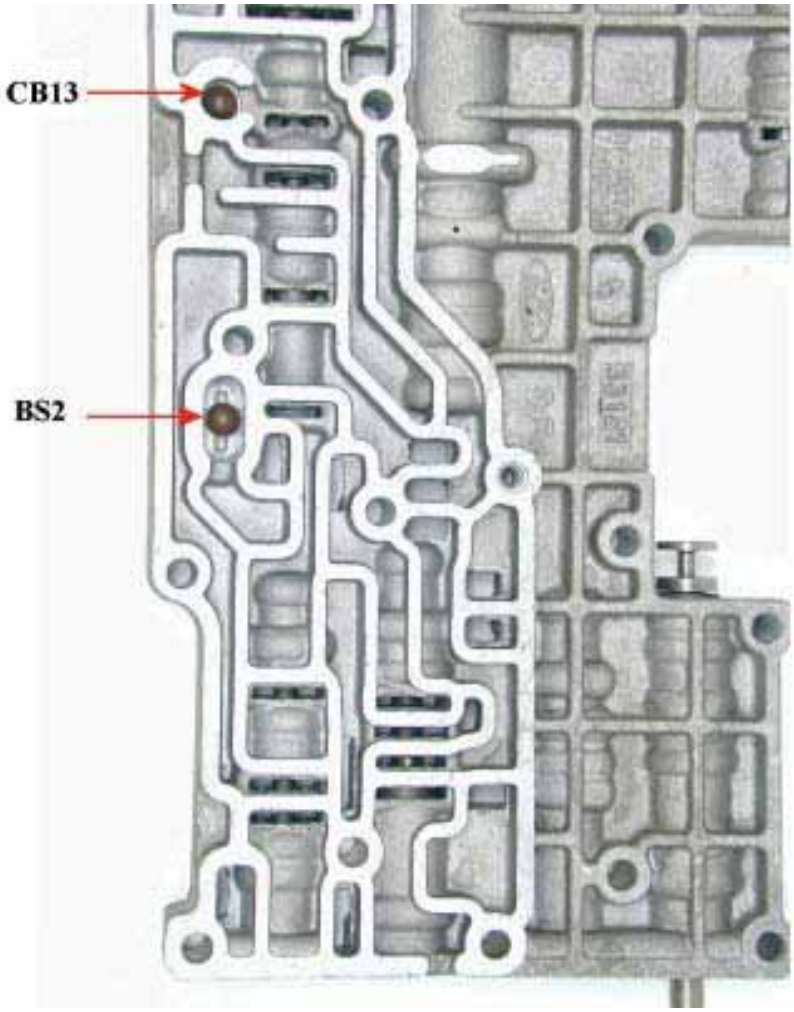
*CB3, CB4, CB5
If the plate has seats for these check balls, a ball must be installed.



E4OD/4R IOO

Check Ball Identification and Symptom Chart (continued)

Early 1989

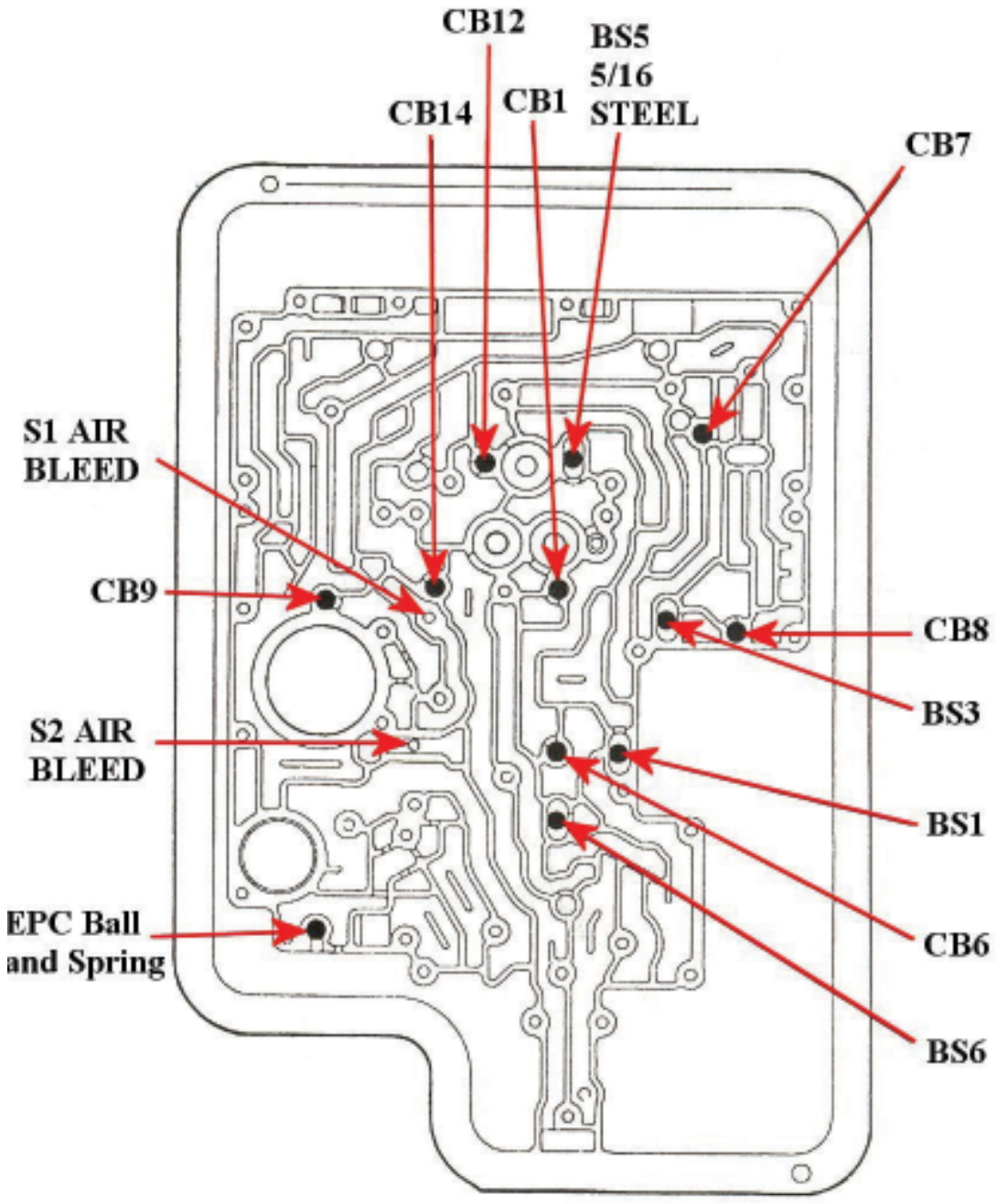


E4OD/4R 100

Check Ball Identification and Symptom Chart (continued)

Late 1989

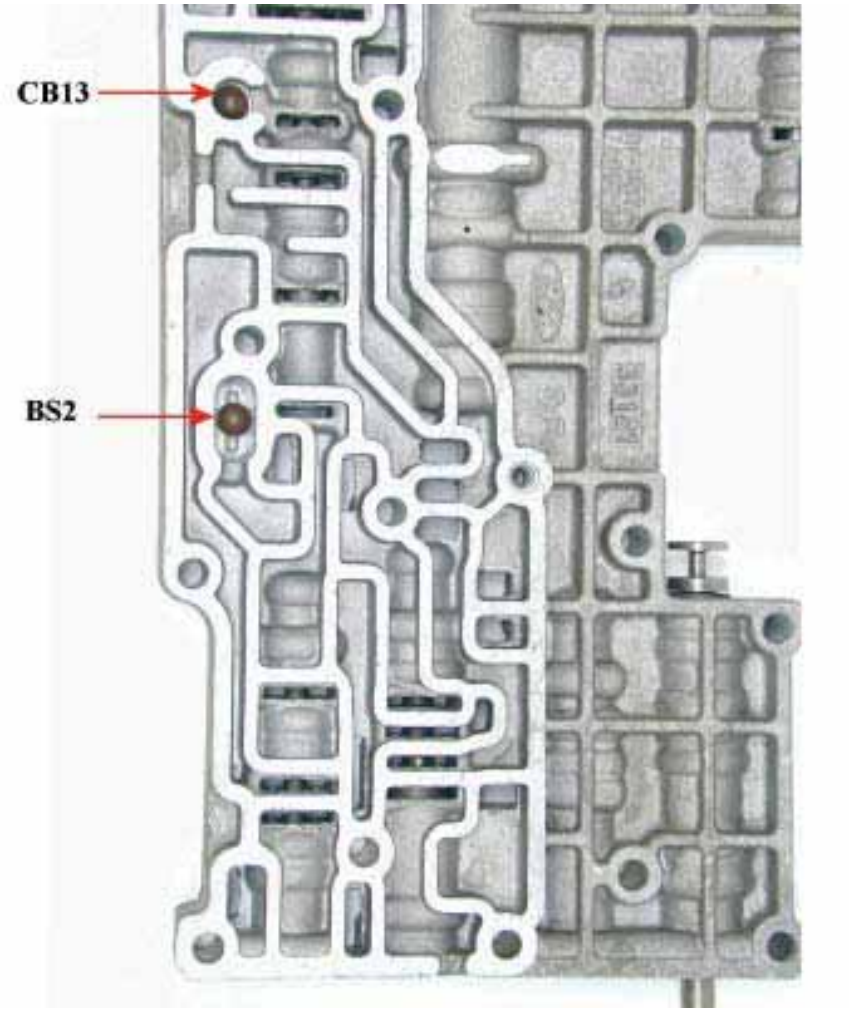
*CB3, CB4, CB5 (See early '89 check ball location page)
If the plate has seats for these check balls, a ball must be installed.



E4OD/4R IOO

Check Ball Identification and Symptom Chart (continued)

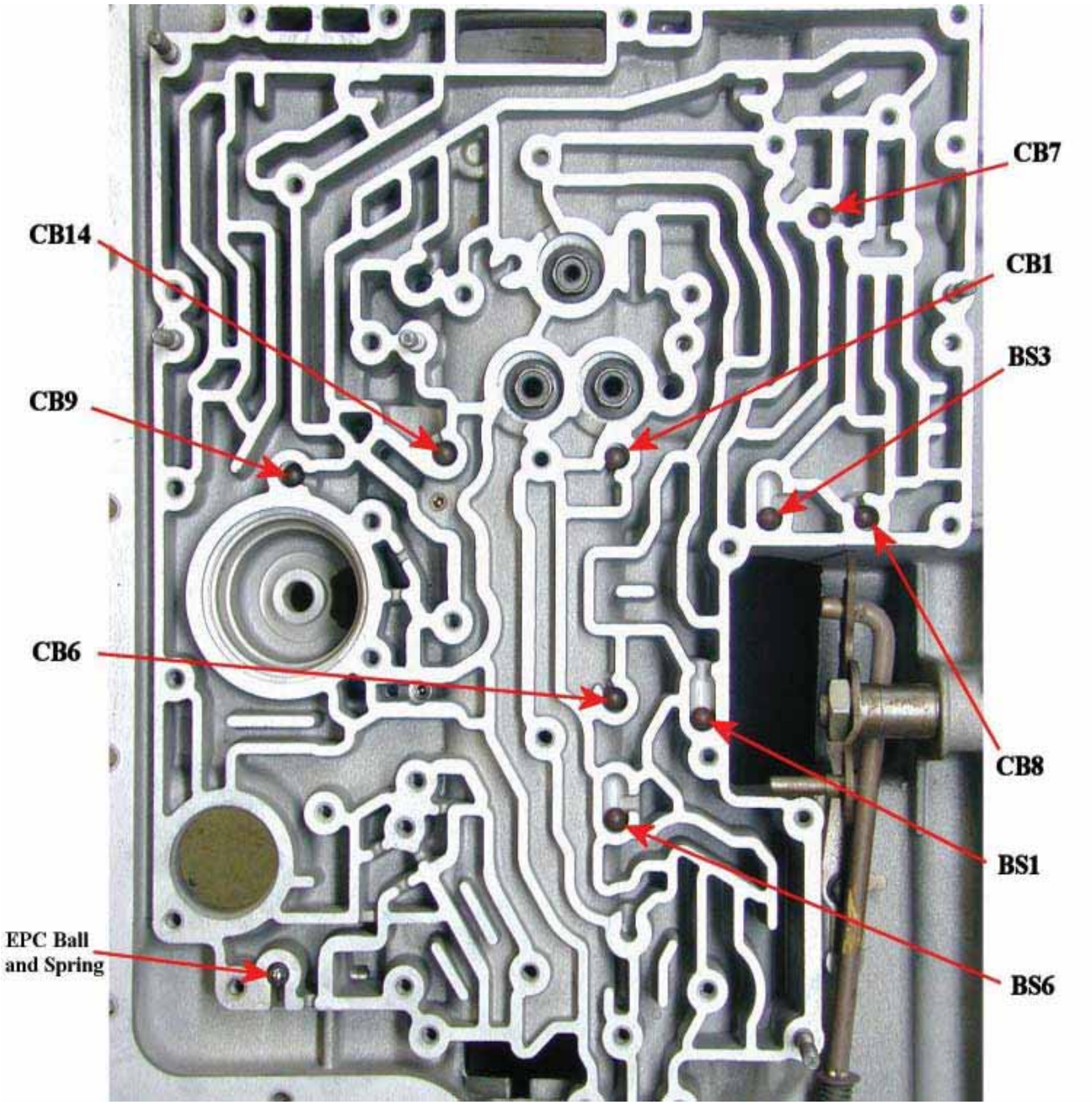
Late 1989



E4OD/4R 100

Check Ball Identification and Symptom Chart (continued)

1990-1995

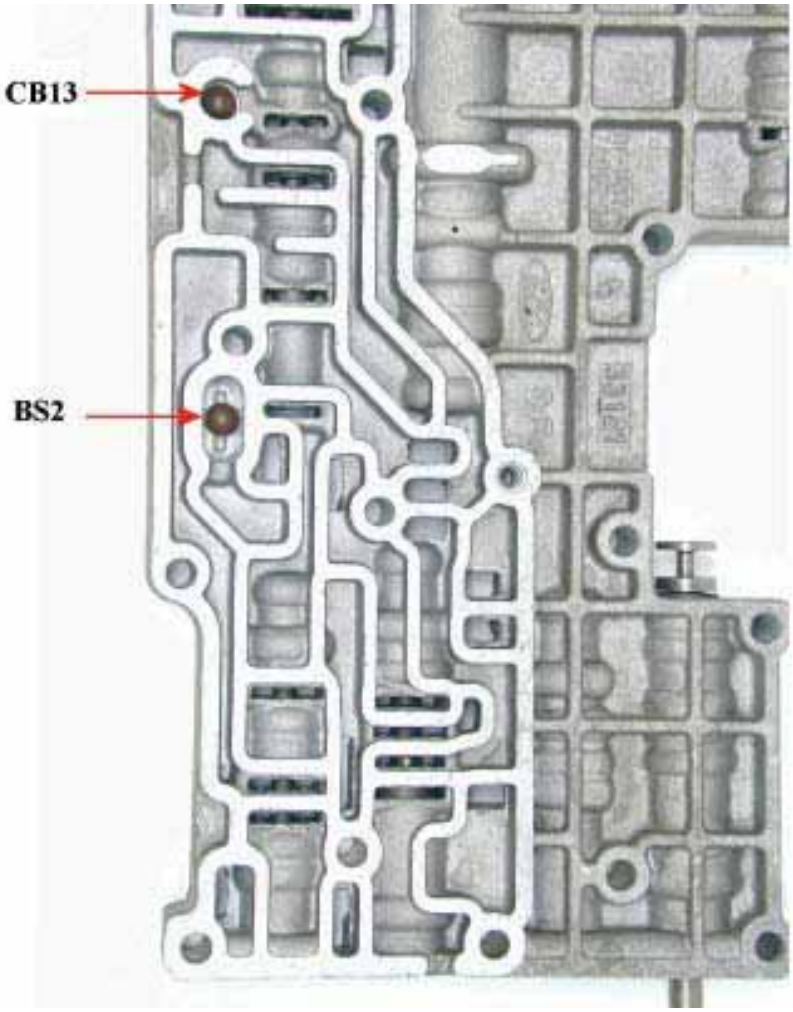


E4OD/4R100

Check Ball Identification and Symptom Chart (continued)

1990-1995

Some '94-'95 manuals labeled CB13 as CB12 in the hydraulics and in the check ball ID section. The function of this ball has always been the same.

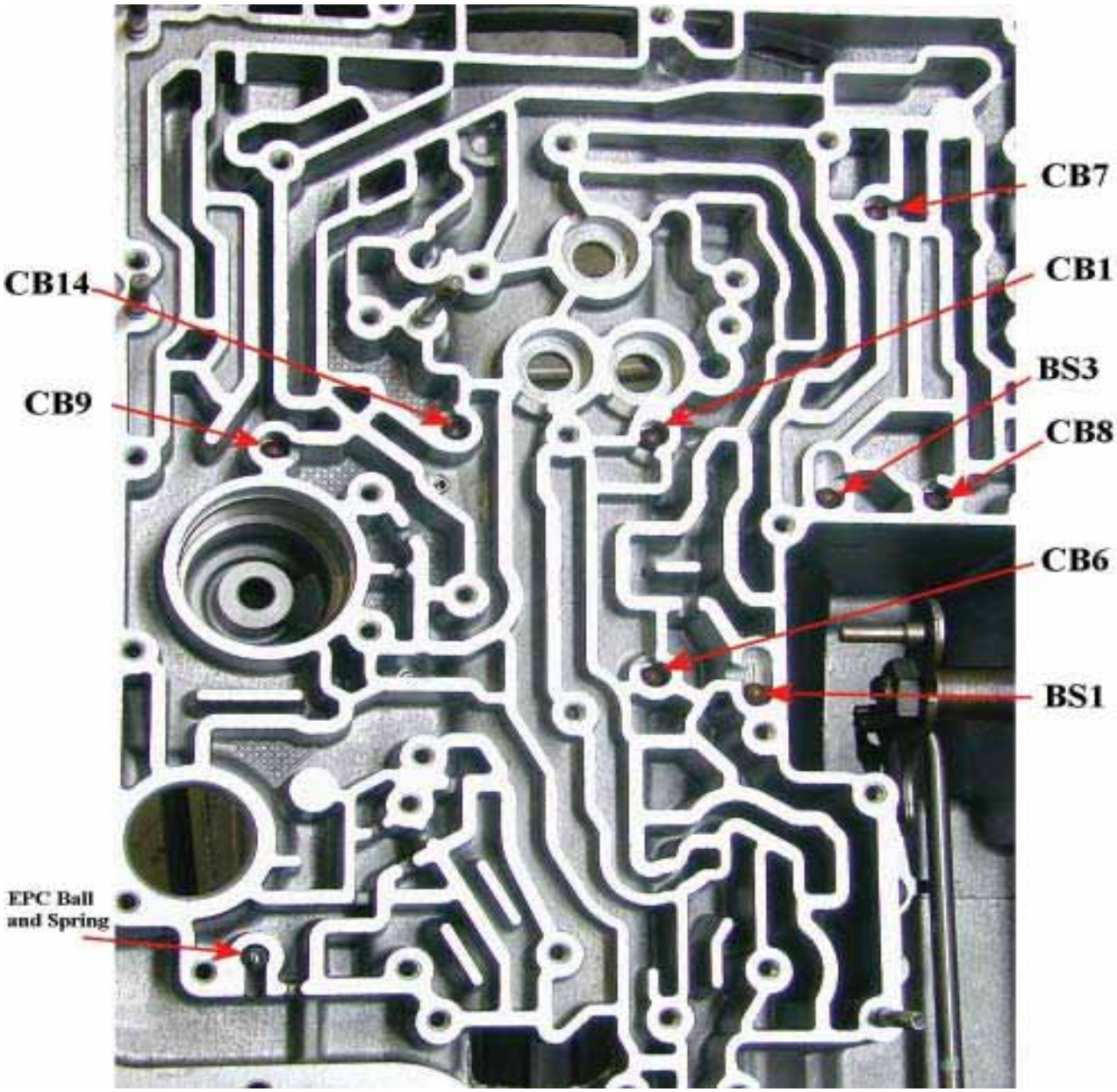


E4OD/4R100

Check Ball Identification and Symtom Chart (continued)

1996-On

Some manuals labeled CB 14 and CB 9 incorrectly.

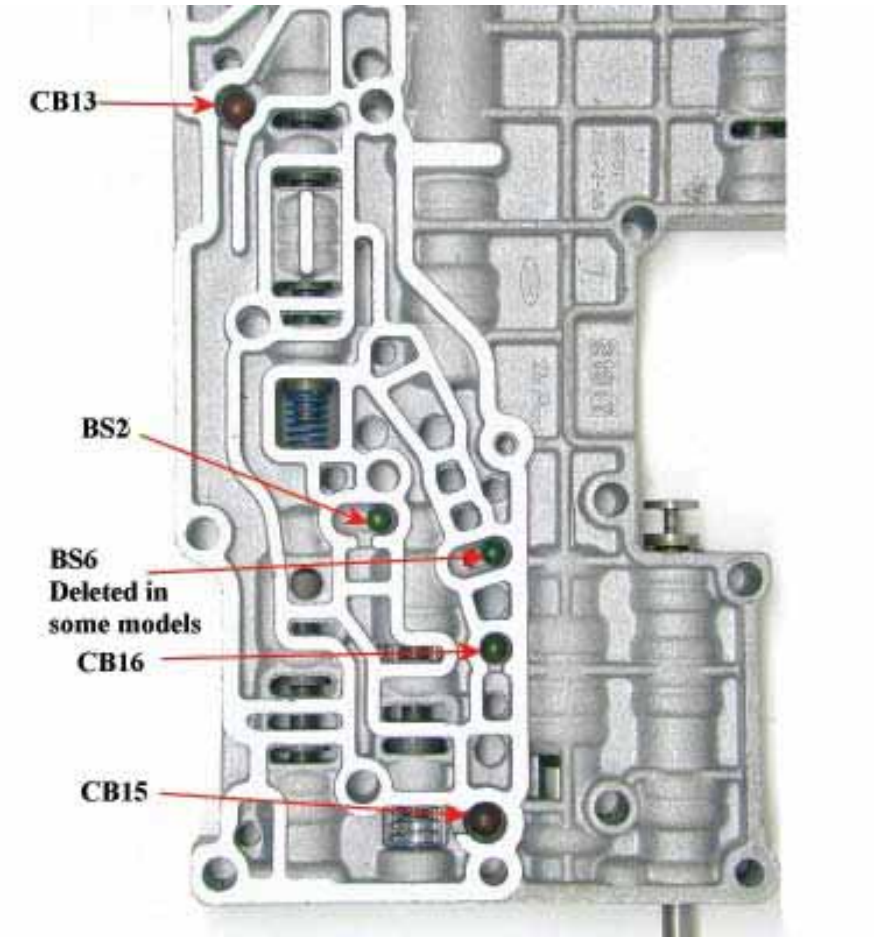


E4OD/4R100

Check Ball Identification and Symtom Chart (continued)

1996-On

The BS6 check ball was deleted in some models. If the plate has two holes over the bath tub you must use a check ball in that location. If the plate has one hole, do not install a check ball.



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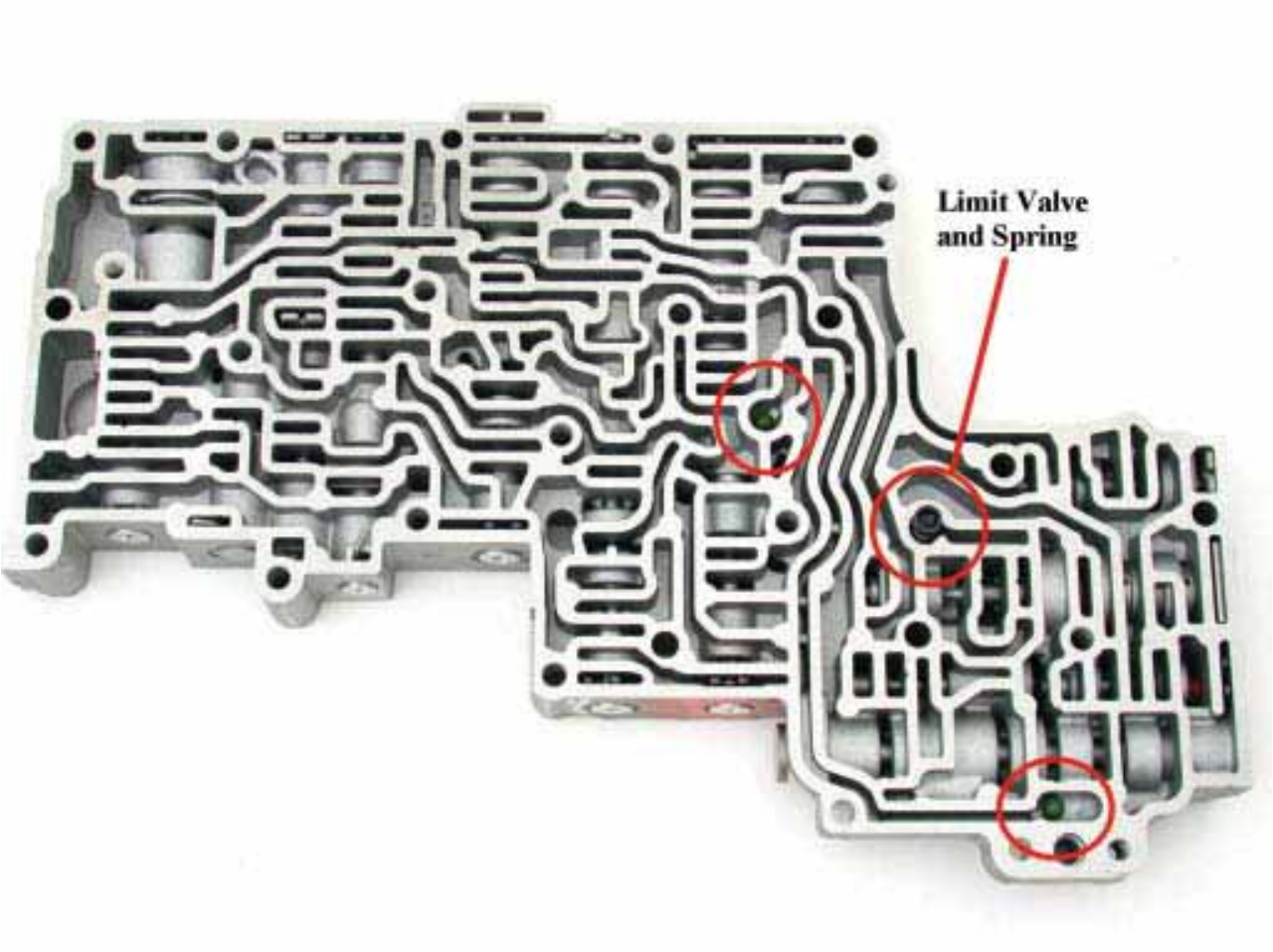
5R55N/W/S

Checkball Locations

5R55N

Check ball locations are important. The 5R55N tansmission only uses two check balls and one limit valve. Take note of the locations and always replace the check balls during reassembly.



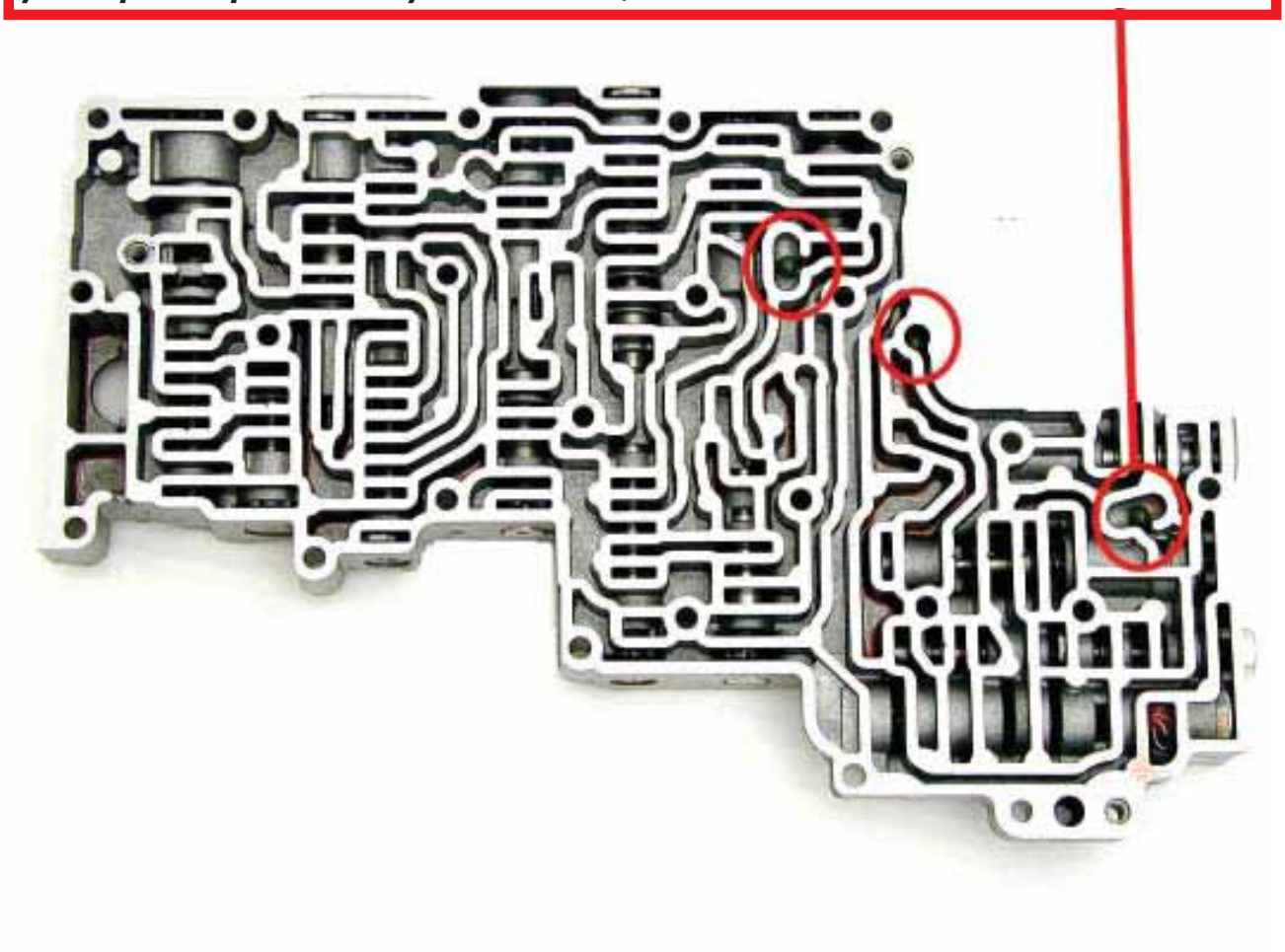
5R55N/W/S

Checkball Locations (continued)

5R55W/S

Not every 5R55W/S transmission has a third check ball. If you mismatch the separator plate you can cause serious failure to the transmission.

If you have two holes in the plate over the bath tub area, it will require a check ball. If your separator plate has only one hole then, no check ball should be installed.



5R55N/W/S

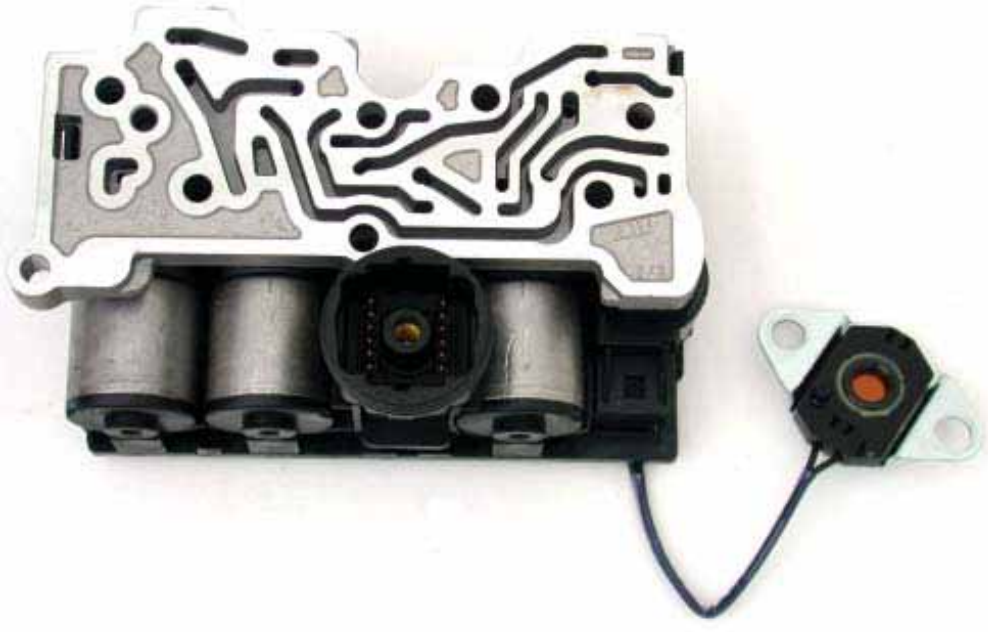
Solenoid Applications

Not every solenoid body is the same. When replacing the solenoid body, be sure to reference the part numbers with the correct model.

5R55N ONLY:
(2000-2002)
XW4Z-7G391-AC (Engineering Part Number XW4P-7G391-AE)

5R55W/S:
(2002-2003 ONLY)
1L2Z-7G391-AE (Engineering Part Number 1L2P-7G391-AF)

5R55S:
(2004)
4L2Z-7G391-AA (Engineering Part Number 4L2P-7G391-AA)
NOTE: Due to the different solenoid transfer functions and calibrations do not use this solenoid body for 2002-2003 5R55W/S models .



5R55N/W/S

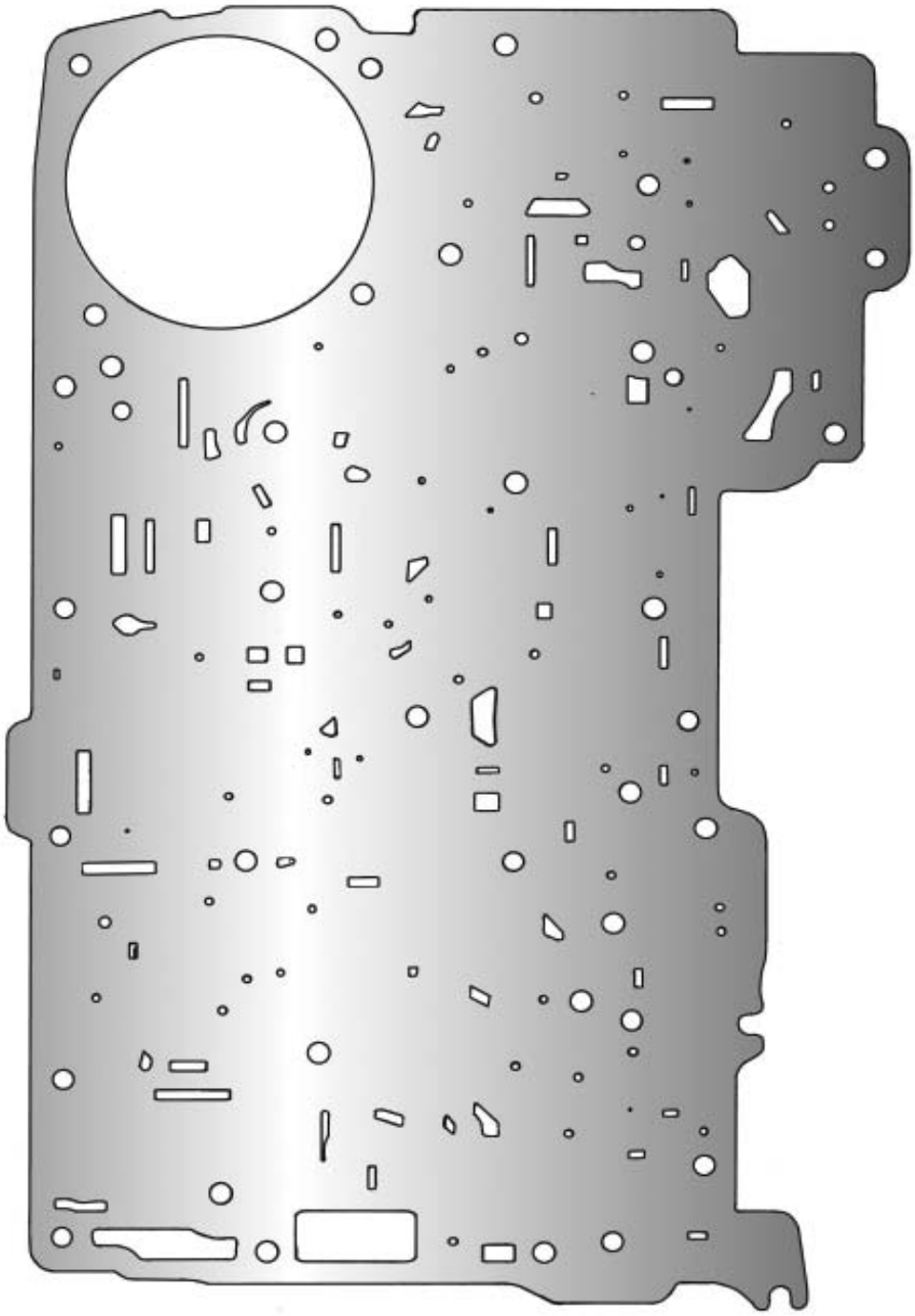
ValveBody Separator Plate Identification

Vehicle Application Chart				
Year	Model	Transmission	Engine	Separator Plate Part Number
2002	T-BIRD	5R55N	V8-3.9L	XW4Z-7Z490-AA
2003-2004	T-BIRD	5R55S	V8-3.9L	3W4Z-7Z490-AA (11/18/02-07/14/03)
2004-2005	T-BIRD	5R55S	V8-3.9L	4W4Z-7Z490-AA (AFTER 07/14/03)
2005	MUSTANG	5R55S	V6-4.0L V8-4.6L	4W4Z-7Z490-AA (AFTER 07/14/03)
1999-2001	S-TYPE JAGUAR	5R55N	V6-3.0L V8-4.0L	
2002-2003	EXPLORER/MOUNTAINEER	5R55W/S	V6-4.0L V8-4.6L	1L2Z-7Z490-AB
2004-2005	EXPLORER/MOUNTAINEER	5R55S	V6-4.0L V8-4.6L	4L2Z-7Z490-AA
2003-2005	AVIATOR	5R55S	TRANS ID(3L2P-E, 3L2P-F)	1L2Z-7Z490-AB
2004-2005	AVIATOR	5R55S	TRANS ID(4L2P-E, 4L2P-F)	4L2Z-7Z490-AA
2003-2005	LINCOLN LS	5R55S	V6-3.0L V8-3.9L	3W4Z-7Z490-AA
2000-2002	LINCOLN LS	5R55N	V6-3.0L V8-3.9L	XW4Z-7Z490-AB
2000	LINCOLN LS	5R55N	TRANS ID (XW4P-A, XW4P-B)	XW4Z-7Z490-AA (REPLACED BY A NEW VALVE BODY PER FORD PART# 2W4Z-7A100-AA)

5R55N/W/S

Valve Body Separator Plate Identification

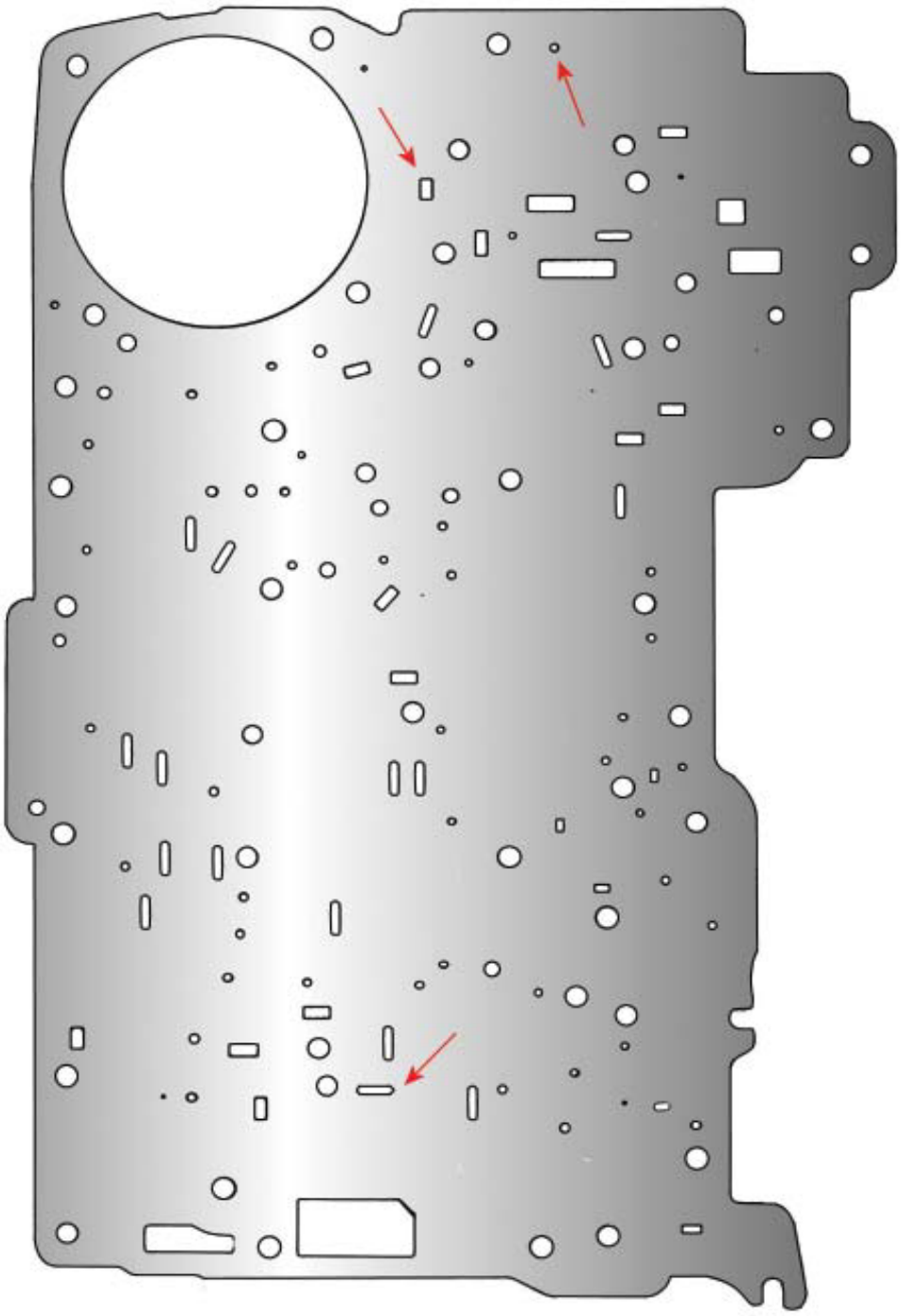
2002 T-Bird, 2000-2002 Lincoln LS Only
XW4Z-7Z490-AB



5R55N/W/S

Valve Body Separator Plate Identification

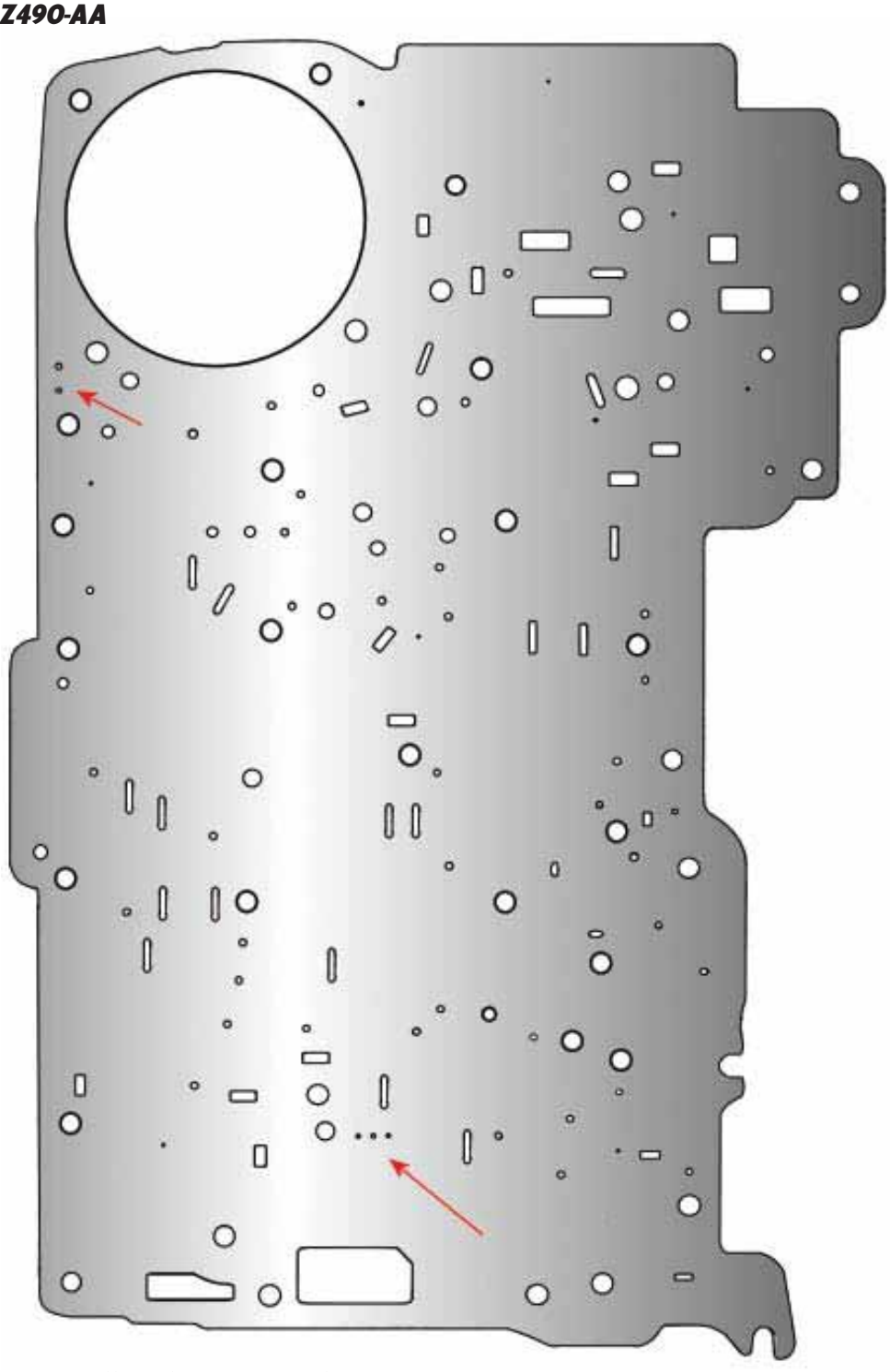
2002-2003 Explorer/Mountaineer, 2003-2005 Aviator
1L2Z-7G490-AB



5R55N/W/S

Valve Body Separator Plate Identification

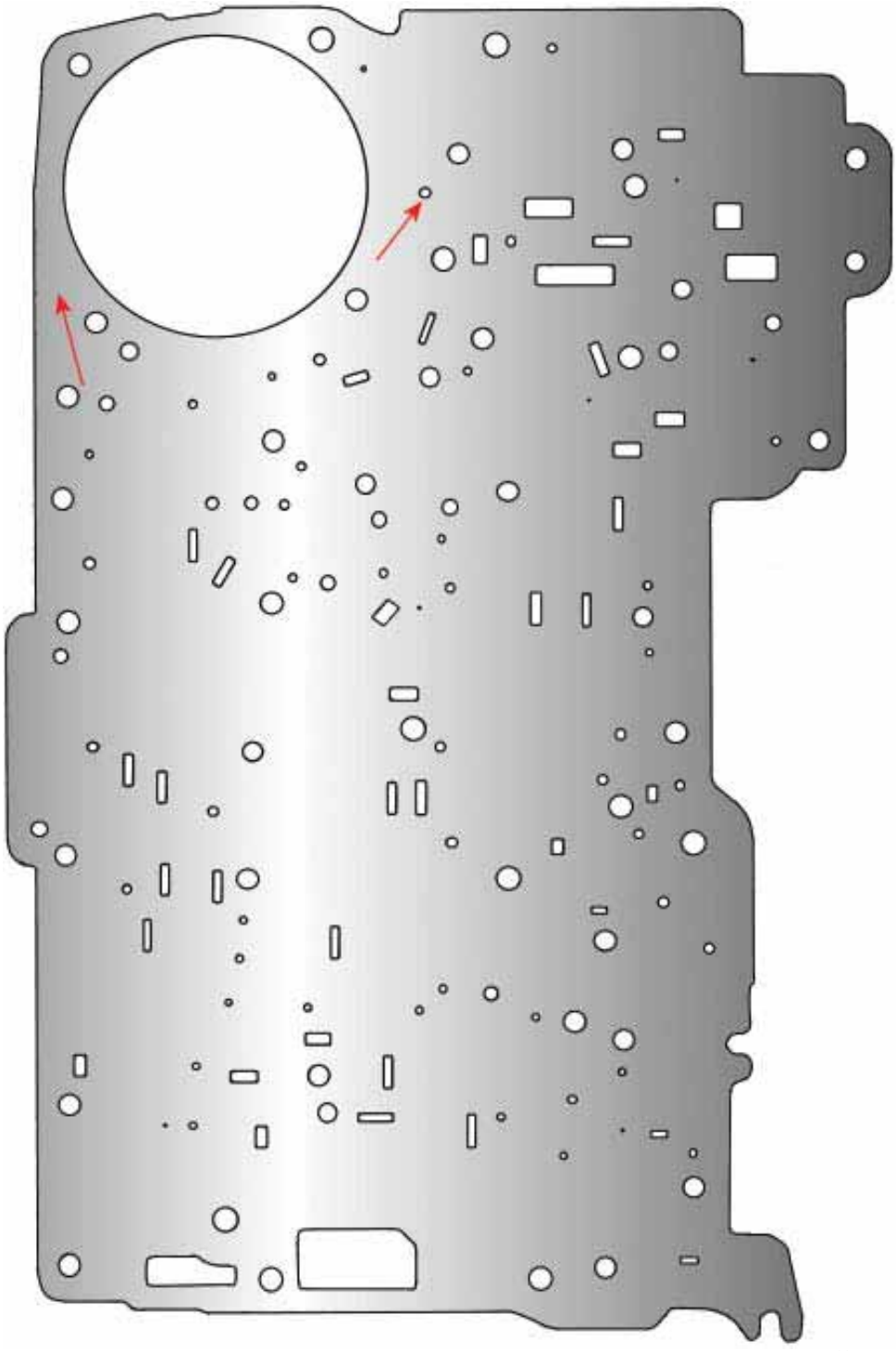
2004-2005 Explorer/Mountaineer, 2004-2005 Aviator
4L2Z-7Z490-AA



5R55N/W/S

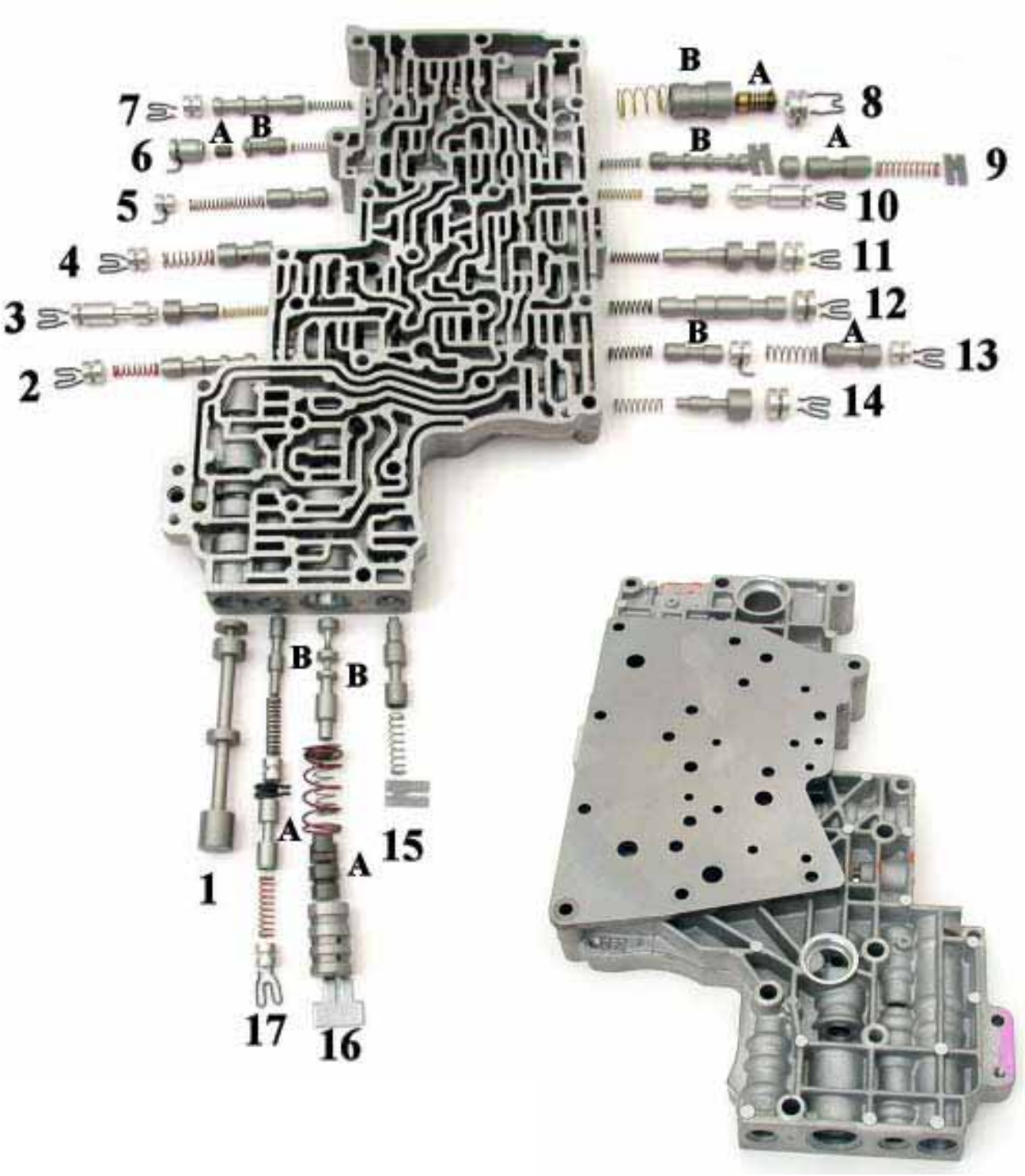
Valve Body Separator Plate Identification

2003-2004 T-Bird, 2003-2005 Lincoln LS
3W4Z-7Z490-AA



5R55N

Valve Body Exploded View



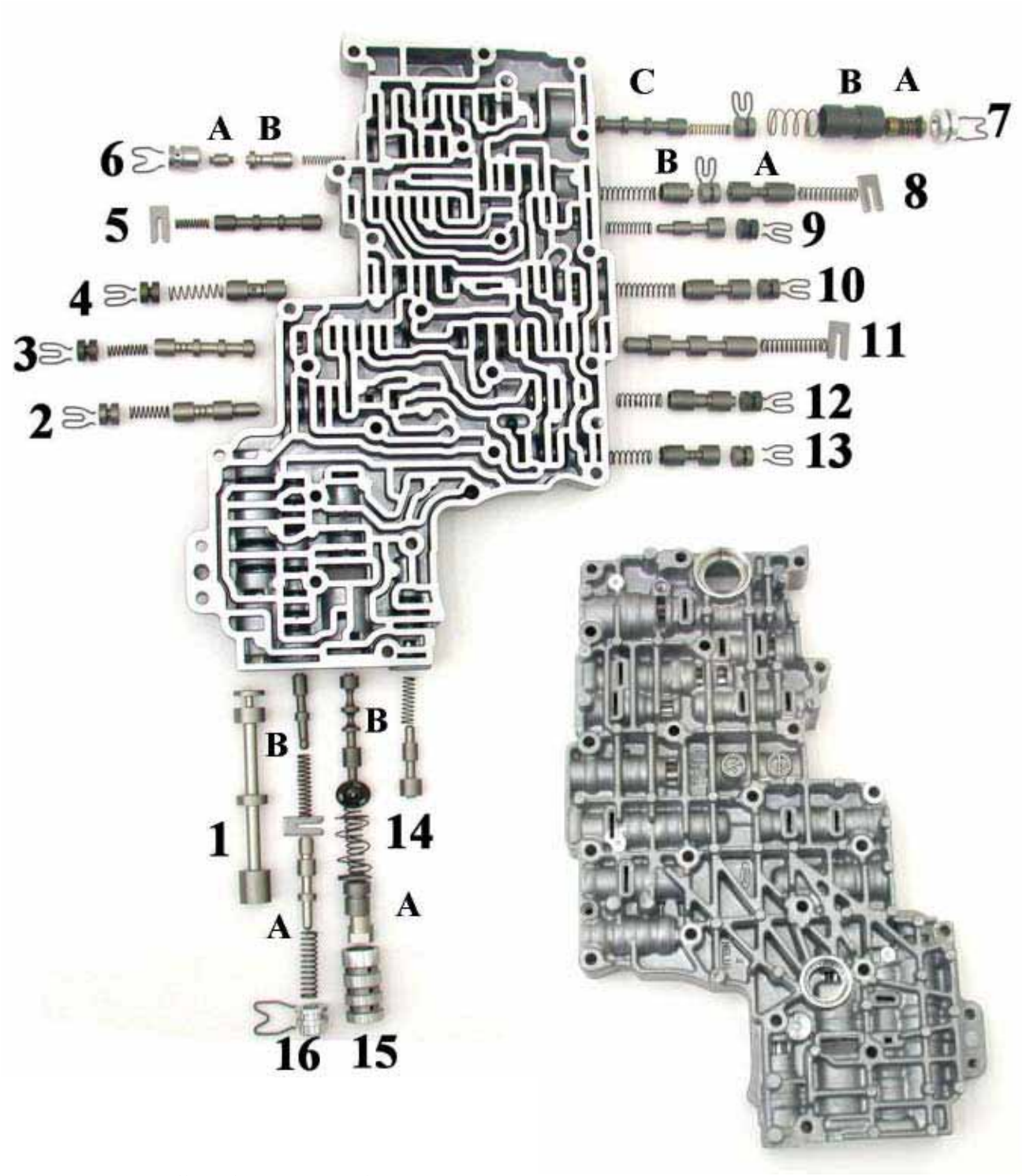
5R55N

Valve Body Exploded View

Valve ID	Valve Description
1	Manual Valve
2	Select Valve
3	Modulator Valve
4	Forward Engagement Control Valve
5	TCC Back Pressure Valve
6	(A) TCC Modulator Control Valve (B) TCC Modulator
7	TCC Control Valve
8	(A) Thermo Valve Assembly (B) Fluid Cooler Bypass Valve
9	(A) Coast Clutch Control Valve
	(B) Overdrive Servo Control Valve
10	Modulator Valve
11	4-3 ISR Downshift Control Valve
12	4-3 Prestroke Intermediate Band Control Valve
13	(A) Reverse Engagement Valve (B) High Clutch Control Valve
14	Reverse Modulator Valve
15	Rear Servo Control
16	(A) Booster Valves (B) Main Regulator Valve
17	(A) Reverse Inhibition Valve (B) Solenoid Regulator Valve

5R55S/W

Valve Body Exploded View



5R55S/W

Valve Body Exploded View

Valve ID	Valve Description
1	Manual Valve
2	Rear Servo Control Valve
3	RS ISA Select Valve
4	Forward Engagement Control Valve
5	Overdrive Servo Control Valve
6	(A) TCC Modulator Control Valve (B) TCC Modulator
7	(A) Thermo Valve Assembly (B) Fluid Cooler Bypass Valve (C) TCC Control Valve
8	(A) Coast Clutch Valve (B) TCC Back Pressure Valve
9	VFS2 Modulator Valve
10	Intermediate Servo Release Valve
11	Direct Clutch Control Valve
12	Reverse Modulator Valve
13	Reverse Engagement Valve
14	VFS1 Modulator Valve
15	(A) Booster Valve (B) Main Regulator Valve
16	(A) Converter Rielief Valve (B) Solenoid Regulator Valve

5R55N

Component Application Chart

Band and Clutch Application Chart A							
	Overdrive Band	Intermediate Band	Reverse Band	Forward Clutch	Intermediate Clutch	Direct Clutch	Coast Clutch
REVERSE			A[3]			A[3]	Ac[2]
1st				A[3]			
2nd	A[3]			A[3]			
3rd				A[3]	A[3]		
4th				A[3]	A[3]	A[3]	
5th	A[3]			A[3]	A[3]	A[3]	
1st[a]			Ac[2]	A[3]			Ac[2]
2nd[a]	A[3]		Ac[2]	A[3]			
3rd[a]				A[3]	A[3]		Ac[2]
4th[a]				A[3]	A[3]	A[3]	Ac[2]
MAN. 3rd		Ac[2]		A[3]	A[3]		Ac[2]
MAN. 2nd	A[3]		Ac[2]	A[3]			
MAN. 1st			Ac[2]	A[3]			Ac[2]

3 A= Applied
a (overdrive canceled)
2 Ac= Applied to carry coast torque

5R55N

Component Application Chart

Band and Clutch Application Chart B							
	O/D One-Way Clutch		Low One-Way Clutch		Intermediate One-way Clutch		Engine Braking
	Drive	Coast	Drive	Coast	Drive	Coast	
REVERSE	H[5]	OR[6]	NE[7]		NE[7]		YES
1st	H[5]	OR[6]	H[5]	OR[6]	NE[7]		NO
2nd	OR[6]	OR[6]	H[5]	OR[6]	NE[7]		NO
3rd	H[5]	OR[6]	OR[6]	OR[6]	H[5]	OR[6]	NO
4th	H[5]	OR[6]	OR[6]	OR[6]	OR[6]		NO
5th	OR[6]	OR[6]	OR[6]	OR[6]	OR[6]		YES
1st[a]	H[5]	OR[6]	H[5]	OR[6]	NE[7]		YES
2nd[a]	OR[6]	OR[6]	H[5]	OR[6]	NE[7]		YES
3rd[a]	H[5]	OR[6]	OR[6]	OR[6]	H[5]	NE[7]	YES
4th[a]	H[5]	OR[6]	OR[6]	OR[6]	OR[6]		Yes
MAN. 3rd	H[5]	OR[6]	OR[6]	OR[6]	H[5]	NE[7]	YES
MAN. 2nd	OR[6]	OR[6]	H[5]	OR[6]	NE[7]		YES
MAN. 1st	H[5]	OR[6]	H[5]	OR[6]	NE[7]		YES

H [5] =Hold
OR [6] =Overrunning
NE [7] =No Effect

5R55N/W/S

Vehicle Application Chart

Vehicle Application Chart			
Year	**Model**	**Transmission**	**Engine**
2000-2002	T-BIRD	5R55N	V8-3.9L
2002-2005	T-BIRD	5R55S	V8-3.9L
1999-2001	S-TYPE JAGUAR	5R55N	V6-3.0L V8-4.0L
2002	EXPLORER/MOUNTAINEER	5R55W/S	V6-4.0L V8-4.6L
2003-2005	EXPLORER/MOUNTAINEER	5R55S	V6-4.0L V8-4.6L
2002-2005	LINCOLN LS	5R55S	V6-3.0L V8-3.9L
2000-2001	LINCOLN LS	5R55N	V6-3.0L V8-3.9L
2005	MUSTANG	5R55S	V6-4.0L V8-4.6L

5R55W/S

5R55N

5R55W/S

Component Application Chart

Band and Clutch Application Chart A						
	Overdrive Band	Intermediate Band	Reverse Band	Forward Clutch	Direct Clutch	Coast Clutch
REVERSE			A [a]		A [a]	Ac [b]
1st				A [a]		
2nd	A [a]			A [a]		
3rd		A [a]		A [a]		
4th				A [a]	A [a]	
5th	A [a]			A [a]	A [a]	
1st [c]				A [a]		
2nd [c]	A [a]			A [a]		
3rd [c]		A [a]		A [a]		
4th [c]				A [a]	A [a]	Ac [b]
MAN. 3rd		Ac [b]		A [a]		Ac [b]
MAN. 2nd	A [a]		Ac [b]	A [a]		
MAN. 1st			Ac [b]	A [a]		Ac [b]

A [a] = Applied
Ac [b] = Applied to carry coast torque
(D) [c] = Position (overdrive canceled)

5R55W/S

Component Application Chart

Band and Clutch Application Chart B					
	Direct One-Way Clutch		Low One-Way Clutch		Engine Braking
	Drive	Coast	Drive	Coast	
REVERSE	H [a]	OR [b]	NE [c]		NO
1st	H[a]	OR[b]	H[a]	OR[b]	NO
2nd	OR[b]	OR[b]	H[a]	OR[b]	NO
3rd	H[a]	OR[b]	OR[b]	OR[b]	NO
4th	H[a]	OR[b]	OR[b]	OR[b]	NO
5th	OR[b]	OR[b]	OR[b]	OR[b]	YES
1st [d]	H[a]	OR[b]	H[a]	OR[b]	YES
2nd[d]	OR[b]	OR[b]	H[a]	OR[b]	YES
3rd[d]	H[a]	OR[b]	OR[b]	OR[b]	YES
4th[d]	H[a]	OR[b]	OR[b]	OR[b]	Yes
MAN. 3rd	H[a]	OR[b]	OR[b]	OR[b]	YES
MAN. 2ND	OR[b]	OR[b]	H[a]	OR[b]	YES
MAN. 1ST	H[a]	OR[b]	H[a]	OR[b]	YES

H [a] =Hold
OR [b] =Overrunning
NE [c] =No Effect
(D) [d] = Position (overdrive canceled)

5R55W/S

2002 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

Sensors/Inputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
FPM	A02	.1/OFF	VBAT/ON	VBAT/ON	VBAT/ON	DCV/OFF-ON
ILC	A08	0	9	9	9	DCV
FEPS	A13	0.1	0.1	0.1	0.1	DCV
PATSIN	A14	VBAT	VBAT	VBAT	VBAT	DCV
4X4(L)	A23	VBAT/OFF	VBAT/OFF	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
BPS	A28	VBAT/OFF	.1/ON (E)	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
SCMA	A29	VBAT	VBAT	VBAT	VBAT	DCV
ACP V/ACP	A30	.1/OPEN	.1/OPEN	.1/OPEN	.1/OPEN	DCV/ OPEN-CLOSED
MAF V	A31	0	.7-.9	1.2-1.4	1.5-2	DCV
SCMB	A36	VBAT	VBAT	VBAT	VBAT	DCV
BPP	A40	.1/OFF	VBAT/ON (E)	.1/OFF	.1/OFF	DCV/OFF-ON
TCS	A41	.1/OFF	VBAT/ON (G)	.1/OFF	.1/OFF	DCV/OFF-ON
SCMC	A46	VBAT	VBAT	VBAT	VBAT	DCV
ACDS	A47	0.1	0.1	0.1	0.1	DCV
ACCS	A50	.1/OFF	VBAT/ON (A)	.1/OFF	.1/OFF	DCV/OFF-ON
IAT	A51	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	DCV/DEG
FTP V/FTP	A52	2.6/0	2.6/0	2.6/0	2.6/0	DCV/IN-H2O
SCCS	A57	5	5	5	5	DCV
TR V/TR	B09	0/PARK	0/PARK	2/OD	2/OD	DCV/MODE
TR 4	B10	0	0	VBAT	VBAT	DCV
TR 2	B18	0	0	VBAT	VBAT	DCV
HCDS	B21	0	200	620	1185	Hz
TR 1	B22	0	0	VBAT	VBAT	DCV
TFT	B23	.5-2.4/210-110	.5-2.4/210-110	.5-2.4/210-110	.5-2.4/210-110	DCV/DEG
OSS	B26	0	0	460/1250	885-1000/ 2100-2400	Hz/RPM

5R55W/S

2002 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

Actuators/ Outputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
O2S12	B28	0.1	(D)	(D)	(D)	DCV
O2S22	B29	0.1	(D)	(D)	(D)	DCV
CHT	C40	.6 or 3.7/194	.6 or 3.7/194	.6 or 3.7/194	.6 or 3.7/194	DCV/DEG
DPFEGR	C41	.95-1.10	.95-1.10	.95-4.65	.95-4.65	DCV
O2S21	C44	0	switching (C)	switching (C)	switching (C)	DCV
O2S11	C45	0	switching (C)	switching (C)	switching (C)	DCV
KS1	C51	0	0	0	0	DCV
KS2	C52	0	0	0	0	DCV
CID	C53	0	6	12-Nov	16	Hz
CKP	C55	0	400	800	970-1050	Hz
TPV	C57	.53-1.27	.53-1.27	1.3-1.5	1.5-1.8	DCV
CPP/PNP	PID	ON	ON	OFF	OFF	OFF/ON
FLI	PID	50	50	50	50	%
GEAR	PID	1	1	4	5	GEAR
LOAD	PID	(L)	16-23	20	25	%
MISF	PID	OFF	OFF	OFF	OFF	OFF-ON
OCTADJS	PID	NO RETARD	NO RETARD	NO RETARD	NO RETARD	NO RETARD/ RETARD
RPM	PID	0	890	1350	1650	RPM
VSS	PID	0	0	30	55	MPH
EVAPCV	A06	0	0-10/0-100	0-10/0-100	0-10/0-100	Hz/%
VSO	A07	0	0	65	125	Hz
WAC	A09	VBAT/OFF	.1/ON (A)	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
TPO	A10	15-Jan	15-Jan	1.4/18	1.8/20	DCV/%
PATSOUT	A11	11.3	11.8	11.8	11.8	DCV
EVAPPDC	A12	0	0-10/0-100	0-10/0-100	0-10/0-100	Hz/%
ACF	A19	0.1	0.1	0.1	0.1	DCV
PATSIL	A22	11.3	11.8	11.8	11.8	DCV
PATSTRT	A39	0.1	0.1	0.1	0.1	DCV
SCC	A45	VBAT	VBAT	VBAT	VBAT	DCV
FP	A58	VBAT/0	.1/100	.1/100	.1/100	DCV/%
SS1	B01	.1/ON	.1/ON	VBAT/OFF	VBAT/OFF	DCV/OFF-ON

5R55W/S

2002 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

Actuators/ Outputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
SS2	B02	VBAT/OFF	VBAT/OFF	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
SS3	B03	VBAT/OFF	VBAT/OFF	VBAT/OFF	.1/ON	DCV/OFF-ON
SS4	B04	.1/ON	.1/ON	.1/ON	.1/ON	DCV/OFF-ON
TCC	B05	VBAT/0	VBAT/0	VBAT/0	.2/100	DCV/%
EPC	B07	5.8	7.6	10.3	10.6	DCV
EPC3	B12	5.9	7.7	12.3	VBAT	DCV
EPC2	B13	8.2	10	8.2	10.8	DCV
HTR12	B15	.2/ON (P)	.2/ON (P)	.2/ON (P)	.2/ON (P)	DCV/OFF-ON
HTR22	B16	.2/ON (P)	.2/ON (P)	.2/ON (P)	.2/ON (P)	DCV/OFF-ON
CDD	C01	VBAT	VBAT	VBAT	VBAT	DCV
INJ1	C02	0	3.3-3.8	5.1	7-Jun	mS
HTR11	C07	.1/ON (P)	.1/ON (P)	.1/ON (P)	.1/ON (P)	DCV/OFF-ON
HTR21	C08	.1/ON (P)	.1/ON (P)	.1/ON (P)	.1/ON (P)	DCV/OFF-ON
IAC	C09	VBAT/0	9.8/28	8.4/45	7.7/65	DCV/%
INJ5	C11	0	3.3-3.8	5.1	7-Jun	mS
CDE	C12	VBAT	VBAT	VBAT	VBAT	DCV
CDC	C13	VBAT	VBAT	VBAT	VBAT	DCV
INJ2	C14	0	3.3-3.8	5.1	7-Jun	mS
EGRVR	C16	VBAT/0	VBAT/0	VBAT/0	10.8/40	DCV/%
INJ6	C21	0	3.3-3.8	5.1	7-Jun	mS
CDF	C22	VBAT	VBAT	VBAT	VBAT	DCV
CDB	C23	VBAT	VBAT	VBAT	VBAT	DCV
INJ3	C24	0	3.3-3.8	5.1	7-Jun	mS
INJ7	C29	0	3.3-3.8	5.1	7-Jun	mS
CDG	C30	VBAT	VBAT	VBAT	VBAT	DCV
CDA	C31	VBAT	VBAT	VBAT	VBAT	DCV
INJ4	C32	0	3.3-3.8	5.1	7-Jun	mS
INJ8	C37	0	3.3-3.8	5.1	7-Jun	mS
CDH	C38	VBAT	VBAT	VBAT	VBAT	DCV
CHTIL	PID	OFF	OFF	OFF	OFF	OFF-ON
FUELPW1	PID	0	3.3-3.8	5.1	7-Jun	mS
FUELPW2	PID	0	3.3-3.8	5.1	7-Jun	mS
LONGFT1	PID	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	%
LONGFT2	PID	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	%
MIL	PID	OFF	OFF	OFF	OFF	OFF-ON
SHRTFT1	PID	0	(-)10-(+)10	(-)10-(+)10	(-)10-(+)10	%
SHRTFT2	PID	0	(-)10-(+)10	(-)10-(+)10	(-)10-(+)10	%
SPARKADV	PID	0	16-Dec	30	28-33	DEG
TCIL	PID	OFF	OFF	OFF	OFF	OFF-ON
KAPWR	A44	VBAT	VBAT	VBAT	VBAT	DCV
VPWR	A32	VBAT	VBAT	VBAT	VBAT	DCV
VREF	A20	5	5	5	5	DCV

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2003-2004 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

Sensors/Inputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
ACDS	B3	0.1	0.1	0.1	0.1	DCV
APP1	B5	4	4	3.4-4.0	2.9-4.0	DCV
BPS	B7	VBAT/OFF	.1/ON (E)	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
BPP	B8	.1/OFF	VBAT/ON (E)	.1/OFF	.1/OFF	DCV/OFF-ON
FTP V/FTP	B9	2.6/0	2.6/0	2.6/0	2.6/0	DCV/IN-H2O
IAT	B16	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	1.7-3.5/120-50 (K)	DCV/DEG
APP2	B17	1.5	1.5	1.4-1.9	1.4-2.4	DCV
FPM	B21	0.1	0 - VBAT	0 - VBAT	0 - VBAT	DCV
4WD MC SW	B22	VBAT	VBAT	VBAT	VBAT	DCV
ILC	B24	0.7	9	9	9	DCV
ACP V	B26	VBAT	VBAT	VBAT	VBAT	DCV
TCS	B27	.1/OFF	VBAT/ON (G)	.1/OFF	.1/OFF	DCV/OFF-ON
APP3	B28	0.9	0.9	.9-1.3	.9-1.8	DCV
4WDSW RTN	B29	0	0	0	0	DCV
MAF V	B32	0	.7-.9	1.2-1.7	1.5-2.4	DCV
PATSIN	B42	VBAT	VBAT	VBAT	VBAT	DCV
FEPS	B44	0.1	0.1	0.1	0.1	DCV
OSS	T3	0	0	460/ 1250	885-1000/ 2100-2400	Hz/RPM
HCDS	T4	0	0	713	1315	Hz
4WD_POS1	T7	VBAT	VBAT	VBAT	VBAT	DCV
4WD_POS2	T8	VBAT	VBAT	VBAT	VBAT	DCV
TSS	T15	0	360/670	713/1300	985/1800	Hz/RPM
TR 1	T16	0	0	VBAT	VBAT	DCV
TR 2	T17	0	0	VBAT	VBAT	DCV
4WD_POS3	T19	VBAT	VBAT	VBAT	VBAT	DCV
4WD_POS4	T20	VBAT	VBAT	VBAT	VBAT	DCV
O2S22	T22	0.1	(D)	(D)	(D)	DCV
O2S12	T24	0.1	(D)	(D)	(D)	DCV
TR3 V/TR3	T27	0/PARK	0/PARK	1.6/OD	1.6/OD	DCV/MODE
TR 4	T28	0	0	VBAT	VBAT	DCV
TFT	T29	.5-2.4/210-110	.5-2.4/210-110	.5-2.4/210-110	.5-2.4/210-110	DCV/DEG
TP1	E19	4.1	4.4	4.1	4	DCV
KS2	E21	0	0	0	0	DCV
CID	E25	0	6	12-Nov	16	Hz
TP2	E29	1.2	0.8	1.1	1.2	DCV

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2003-2004 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

Sensors/Inputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
O2S11	E30	0	switching (C)	switching (C)	switching (C)	DCV
O2S21	E31	0	switching (C)	switching (C)	switching (C)	DCV
KS1	E32	0	0	0	0	DCV
CHT	E33	.6 or 3.7/194	.6 or 3.7/194	.6 or 3.7/194	.6 or 3.7/194	DCV/DEG
CKP	E34	0	400	800	970-1050	Hz
FRP V/FRP	E37	3.0/40	2.8/40	2.8/40	2.8/40	DCV/PSI
DPFEGR	E44	.25-1.30	.25-1.30	.25-4.65	.25-4.65	DCV
FLI (H)	PID	50	50	50	50	%
GEAR	PID	1	1	4	5	GEAR
LOAD	PID	(L)	16-23	20	25-37	%
RPM	PID	0	630-750	1465	1726	RPM
VSS	PID	0	0	30	55	MPH
VSO	B1	0	0	67	125	Hz
PATSTRT	B2	0.1	0.5	0.5	0.5	DCV
FP	B12	8.4	2.5	2.8	2.8	DCV
EVAPCV	B13	VBAT/ 0	VBAT/ 0	VBAT/ 0 (S)	VBAT/ 0 (S)	DCV/ %
WAC (ACCR)	B25	VBAT/OFF	.1/ON (A)	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
PATSOUT	B31	VBAT	VBAT	VBAT	VBAT	DCV
4WDT_IL	B33	0.1	0.1	0.1	0.1	DCV
4WDL_IL	B46	VBAT	VBAT	VBAT	VBAT	DCV
EVMV	B34	0	0	500-900 (F)	500-900 (F)	mA
PATSIL	B37	11	13	13	13	DCV
EPC	T11	6	8	10	10	DCV
EPC2	T23	8	10	10	10	DCV
EPC3	T34	6	8	VBAT	VBAT	DCV
SS1	T42	.1/ON	.1/ON	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
SS2	T43	VBAT/OFF	VBAT/OFF	VBAT/OFF	VBAT/OFF	DCV/OFF-ON
SS3	T44	VBAT/OFF	VBAT/OFF	VBAT/OFF	.1/ON	DCV/OFF-ON
SS4	T45	.1/ON	.1/ON	VBAT/OFF	.1/ON	DCV/OFF-ON
TCC	T46	VBAT/0	VBAT/0	VBAT/0	.2/100	DCV/%
HTR12	T47	12.0/OFF (P)	.2/ON (P)	.2/ON (P)	.2/ON (P)	DCV/OFF-ON
HTR22	T48	12.0/OFF (P)	.2/ON (P)	.2/ON (P)	.2/ON (P)	DCV/OFF-ON
4WD_CLUTCH	T49	0.5	0.2	0.2	0.2	DCV
CDA (CYL1)	E1	VBAT	VBAT	VBAT	VBAT	DCV
INJ1	E2	0	3.3-3.8	5.1	7-Jun	mS
INJ2	E3	0	3.3-3.8	5.1	7-Jun	mS
INJ3	E4	0	3.3-3.8	5.1	7-Jun	mS
INJ4	E5	0	3.3-3.8	5.1	7-Jun	mS
EGRVR	E6	VBAT/0	VBAT/0	(V)	(V)	DCV/%

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2003-2004 Computer Pin Charts for Explorer/Mountaineer

4.6L Explorer/Mountaineer

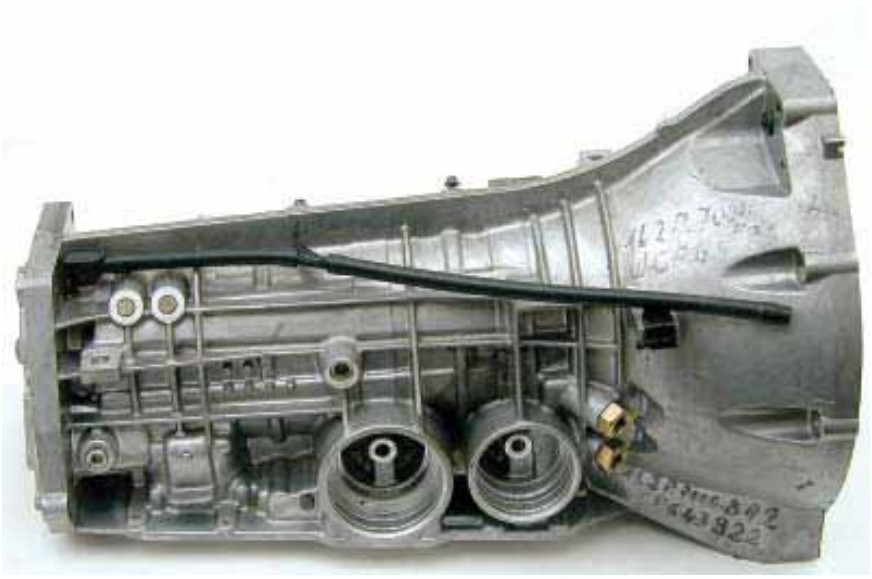
Actuators/ Outputs	PCM Pin/PID only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	30 MPH	55 MPH	
INJ5	E8	0	3.3-3.8	5.1	7-Jun	mS
INJ6	E9	0	3.3-3.8	5.1	7-Jun	mS
INJ7	E10	0	3.3-3.8	5.1	7-Jun	mS
INJ8	E11	0	3.3-3.8	5.1	7-Jun	mS
CDD (CYL2)	E12	VBAT	VBAT	VBAT	VBAT	DCV
CDB (CYL3)	E24	VBAT	VBAT	VBAT	VBAT	DCV
CDG (CYL4)	E35	VBAT	VBAT	VBAT	VBAT	DCV
CDF (CYL5)	E38	VBAT	VBAT	VBAT	VBAT	DCV
CDE (CYL6)	E39	VBAT	VBAT	VBAT	VBAT	DCV
CDC (CYL7)	E42	VBAT	VBAT	VBAT	VBAT	DCV
CDH (CYL8)	E43	VBAT	VBAT	VBAT	VBAT	DCV
TACMP	E47	3.8	VBAT	VBAT	VBAT	DCV
TACMN	E48	3.8	VBAT	VBAT	VBAT	DCV
HTR11	E49	12.0/OFF (P)	.1/ON (P)	.1/ON (P)	.1/ON (P)	DCV/OFF-ON
HTR21	E50	12.0/OFF (P)	.1/ON (P)	.1/ON (P)	.1/ON (P)	DCV/OFF-ON
CHTIL	PID	OFF	OFF	OFF	OFF	OFF-ON
FUELPW1	PID	0	3.3-3.8	5.1	7-Jun	mS
FUELPW2	PID	0	3.3-3.8	5.1	7-Jun	mS
LONGFT1	PID	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	%
LONGFT2	PID	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	(-)20-(+)20	%
MIL	PID	OFF	OFF	OFF	OFF	OFF-ON
SHRTFT1	PID	0	(-)10-(+)10	(-)10-(+)10	(-)10-(+)10	%
SHRTFT2	PID	0	(-)10-(+)10	(-)10-(+)10	(-)10-(+)10	%
SPARKADV	PID	0	16-Dec	30-35	28-35	DEG
TCIL	PID	OFF	OFF	OFF	OFF	OFF-ON
KAPWR	B45	VBAT	VBAT	VBAT	VBAT	DCV
VPWR	B35,36	VBAT	VBAT	VBAT	VBAT	DCV
VREF	B40, T40	5	5	5	5	DCV
ETCVREF	B4, E18	5	5	5	5	DCV

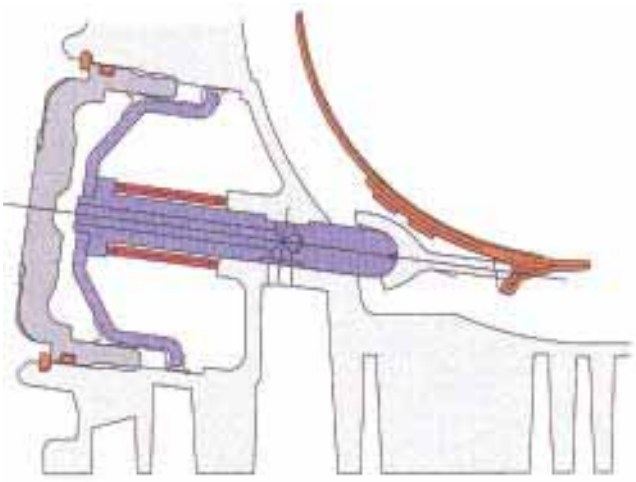
5R55W

Slipping 2nd/5th Gears, Binds on the 2-3 Shift

Overdrive Servo Bore Wear

The symptom may be erratic. Before removing the transmission, always check the pressures to determine the cause of the problem. If the pressures are normal, check the O/D servo bore for premature wear. Side loading causes the Servo to wear the bore excessively.





5R55W

Erratic Shifts

Drive Cycle Procedure

Erratic shifts after an overhaul may be caused by a relearn strategy. DO NOT remove the transmission and attempt to make any repairs until you thoroughly drive the vehicle. Don't be alarmed if you have to drive the vehicle for up to 4 hours.

Many concerns will be associated with the transmission:

- No upshift without lifting the throttle
- 2-3 flare 3-4 and 4-5 OK
- 1-2 shift late and harsh
- 2-3 flare and on time

Drive Cycle Recommendations:

1. Most OBDII monitors will complete more readily using a "steady foot" driving style during cruise or acceleration modes. Operating the throttle in a "smooth" fashion will minimize the time required for monitor completion.

2. Fuel tank level should be between 1/2 and 3/4 fill with 3/4 fill being the most desirable.

3. The Evaporative Monitor can only operate during the first 30 minutes of engine operation. When executing the procedure for this monitor, stay in part throttle mode and drive in a smooth fashion to minimize "fuel slosh".

An adaptive learning strategy in the PCM controls the shift feel and timing on the transmission. This feature is designed to increase durability and provide consistent shift feel over the life of the vehicle. As a result of the battery being disconnected, the transmission may have firm and/or soft shifts. This operation is considered normal and will not affect the function or durability of the transmission. Once the vehicle is at operating temperature it may take several shifts at that same operating condition before the transmission will operate properly. Over time, the adaptive learning process will fully update the operation of the transmission. The more varied the driving habits the longer it may take.

Disconnected Battery

When the battery has been disconnected, or a new battery installed certain transmission operating parameters may be lost. The powertrain control module (PCM) must relearn these parameters. During this learning process you may experience slightly firm shifts, delayed, or early shifts. This operation is considered normal and will not affect the function of the transmission. Normal operation will return once these parameters are stored by the PCM.

5R55W

Erratic Shifts (continued)

Drive Cycle Procedure

OBDII Monitor Exercised	Drive Cycle Procedure	Purpose of Drive Cycle Procedure
Drive Cycle Preparation	1. Install scan tool. Turn key on with the engine off. Cycle key off, then on. Select appropriate Vehicle & Engine qualifier. Clear the continuous diagnostic trouble codes (DTCs) and reset the emission monitors information in the powertrain control module (PCM). 2. Begin to monitor the following PIDs: ECT, EVAPDC, FLI (if available) and TP MODE. Start vehicle WITHOUT returning to Key Off. 3. Idle vehicle for 15 seconds. Drive at 64 Km/h (40 MPH) until ECT is at least 76.7°C (170°F).	Bypass engine soak timer. Resets OBDII Monitor status.
Prep for Monitor Entry	4. Is IAT within 4.4 to 37.8°C (40 to 100°F)? If not, complete the following steps, but note that step 14 will be required to "bypass" the EVAP monitor and clear the P1000.	Engine warm-up and provide IAT input to the PCM.
HEGO	5. Cruise at 64 Km/h (40 MPH) for at least 5 minutes.	Executes the HEGO monitor.
EVAP	6. Cruise at 64 to 128 Km/h (45 to 65 MPH) for 10 minutes (avoid sharp turns and hills). NOTE: To initiate the monitor TP MODE should = PT, EVAPDC must be > 75%, and FLI must be between 15 and 85%.	Executes the EVAP monitor (If IAT is within 4.4 to 40°C (40 to 120°F).
Catalyst	7. Drive in stop-and-go traffic conditions. Include five different constant cruise speeds, ranging from 32 to 112 Km/h (20 to 70 MPH) over a 10 minute period.	Executes the Catalyst Monitor.
EGR	8. From a stop, accelerate to 72 Km/h (45 MPH) at 1/2 to 3/4 throttle. Repeat 3 times.	Executes the EGR Monitor.
SEC AIR/CCM (Engine)	9. Bring the vehicle to a stop. Idle with transmission in drive (neutral for M/T) for 2 minutes.	Executes the ISC portion of the CCM.

5R55W

Erratic Shifts (continued)

Drive Cycle Procedure

OBDII Monitor Exercised	Drive Cycle Procedure	Purpose of Drive Cycle Procedure
CCM (Trans)	10. For M/T, accelerate from 0 to 80 Km/h (0 to 50 MPH), continue to step 11. For A/T, from a stop and in overdrive, moderately accelerate to 80 Km/h (50 MPH) and cruise for at least 15 seconds. Stop vehicle and repeat without overdrive to 64 Km/h (40 MPH) cruising for at least 30 seconds. While at 64 Km/h (40 MPH), activate overdrive and accelerate to 80 Km/h (50 MPH) and cruise for at least 15 seconds. Stop for at least 20 seconds and repeat step 10 five times.	Executes the transmission portion of the CCM.
Misfire & Fuel Monitors	11. From a stop, accelerate to 104 Km/h (65 MPH). Decelerate at closed throttle until 64 Km/h (40 MPH) (no brakes). Repeat this 3 times.	Allows learning for the misfire monitor.
Readiness Check	12. Access the On-Board System Readiness (OBDII monitor status) function on the scan tool. Determine whether all non-continuous monitors have completed. If not, go to step 13.	Determines if any monitor has not completed.
Pending Code Check and EVAP Monitor "Bypass" Check	13. With the scan tool, check for pending codes. Conduct normal repair procedures for any pending code concern. Otherwise, rerun any incomplete monitor. If the EVAP monitor is not complete AND IAT was out of the 4.4 to 37.8 °C (40 to 100 °F) temperature range in step #4, or the altitude is over 2438 m. (8000 ft.), the EVAP "bypass" procedure must be followed. Proceed to Step 14.	Determines if a pending code is preventing the clearing of P1000.
EVAP Monitor "Bypass"	14. Park vehicle for a minimum of 8 hours. Repeat steps 2 through 12. DO NOT REPEAT STEP 1.	Allow the "bypass" counter to increment to two.

5R55W

TCIL Illuminated, Code P0713, Multiple Codes

2002 Explorer/Mountaineer

Vehicles equipped with a 5R55W transmission and DTC P0713 may have water intrusion in the transmission solenoid body connector.

Check the transmission solenoid body connector for signs of water intrusion. If water intrusion is present, replace the Transmission Wiring Harness with part number 1L2Z-7C078-AB. A new harness has been released to prevent this condition.

Part Number	Part Name
1L2Z-7C078-AB	Transmission Wiring Harness

NOTE: An adaptive learning strategy in the PCM controls the shift feel and timing on the transmission. This feature is designed to increase durability and provide consistent shift feel over the life of the vehicle. As a result of the battery being disconnected, the transmission may have firm and/or soft shifts. This operation is considered normal and will not affect the function or durability of the transmission. Once the vehicle is at operating temperature it may take several shifts at that same operating condition before the transmission will operate properly. Over time, the adaptive learning process will fully update the operation of the transmission. The more varied the driving habits the longer it may take.

5R55W

TCIL Illuminated, Code P0713, Multiple Codes (continued)

Harness Replacement Procedure

To replace the harness:

1. Disconnect the battery.
2. Remove the transmission connector from the Powertrain Electronic Controller (PTEC), center pocket.
3. Remove the transmission harness from the retainers along the dash panel.
4. Ensure the transmission wiring harness is loosened at the rear of the engine.
5. Attach a length of wire or string to the PTEC connector to assist in pulling/routing of the new transmission wiring harness back up from below the vehicle.
6. Raise the vehicle on the hoist.
7. Pull the transmission harness down from above leaving the wire/string in place.
8. Remove the old transmission harness from the rest of the transmission.
9. Carefully clean around the solenoid body connector prior to disconnecting to prevent contamination from getting into the connector.
10. Blow out the solenoid body connector to ensure it is dry.
11. Lubricate the O-rings in the solenoid body connector with dielectric grease to ease assembly.
12. Torque the solenoid body connector screw to 5 N-m (44 lb-in). DO NOT OVERTIGHTEN.
13. Reroute the new harness onto the transmission.
14. Attach to the PTEC connector.
15. Lower the vehicle off of the hoist.
16. Pull the transmission harness back up from below.
17. Reroute the wiring along the dash panel and attach in the retainers.
18. Reconnect the transmission connector to PTEC, center pocket. Torque the PTEC connector screw at 6 N-m (53 lb-in).
19. Raise the vehicle on the hoist to install one pushpin for the harness at the back of the engine that is not accessible at Step 17.
20. Lower the vehicle off of the hoist.
21. Reconnect the battery.
22. Verify the repair.

5R55N/W/S

Broken Flexplate, Vibration at Idle, Vibration while Driving

A special tool must be used when installing the adapter plate to the torque converter. In order to correctly install the special service tool, use one round hole and one oblong hole. Rotunda Part #307-403

Using two oblong holes will cause damage to the transmission

4R44/55E, 5R44/55E

TCC Slip Codes

Always verify you have the correct EPC and TCC solenoid. The conception that the updated solenoid will work for all years is wrong. Only use the correct solenoid for the correct year, refer to the list below.

TCC Solenoids
1995-1996 Explorer, Ranger, Aerostar
F5TZ-7F037-AA

1997-Only Aerostar
1997-2001 4DR Explorer
1997-2003 Explorer Sport
1997-2005 Explorer Sport Trac, Ranger
XL2Z-7G136-AA

EPC Solenoids
1995-1996 Explorer, Ranger, Aerostar
F5TZ-7H144-A

1997-Only Aerostar
1997-2001 4DR Explorer
1997-2003 Explorer Sport
1997-2005 Explorer Sport Trac, Ranger
XL2Z-7G383-AA

5R55E

Gear Noise, Whine in 1st, 2nd and Third Gear

Some 2001-2003 Rangers, 2001-2003 Explorer Sport/Sport Trac
Vehicles equipped with a 5R55E automatic transmission and 4.0L engine, may exhibit a gear whine type of noise in 1st, 2nd and 3rd gear ONLY. This may be caused by the Reverse and Forward Planetary assemblies and/or the driveshaft.

Verify that only these conditions exist and no DTCs are present. If other conditions are present and DTCs exist they must be diagnosed and serviced first. Once all other conditions are serviced and only the 1st, 2nd and 3rd gear whine are still present, refer to the following Service Procedure. Using the chart provided, select the parts that need to be replaced.

Replace the Forward and Reverse Planetary assemblies.

Application and Component Replacement Chart	
2001-2003 Ranger	Forward and Reverse Planetaries
2001-2002 Explorer Sport built prior to 8/12/02	Forward and Reverse Planetaries Only and NO Driveshaft
2001-2002 Explorer Sport Trac 4x4 built prior to 8/12/02	Forward and Reverse Planetaries Only and NO Driveshaft
2001-2002 Explorer Sport Trac 4x2 built prior to 8/12/02	Forward and Reverse Planetaries and Driveshaft
2002 -2003 Explorer Sport Trac 4x2, built 8/12/02 thru 10/18/02	Driveshaft Only

PART NUMBER	PART NAME
XL2Z-7D006-AA	Reverse Planetary Assembly
XL2Z-7A398-AA	Forward Planetary Assembly
2L2Z-4602-AA	Driveshaft

4F27E

TCC Engagement Concerns

The turbine shaft bushing clearance is critical, the bushings are used to separate the T/C F (TCC release) and T/C R (TCC apply) oil circuits. Worn bushings allow TCC apply oil pressure to leak into the TCC release circuit, causing partial TCC release and TCC slip codes.

4F27E

End Cover Failure

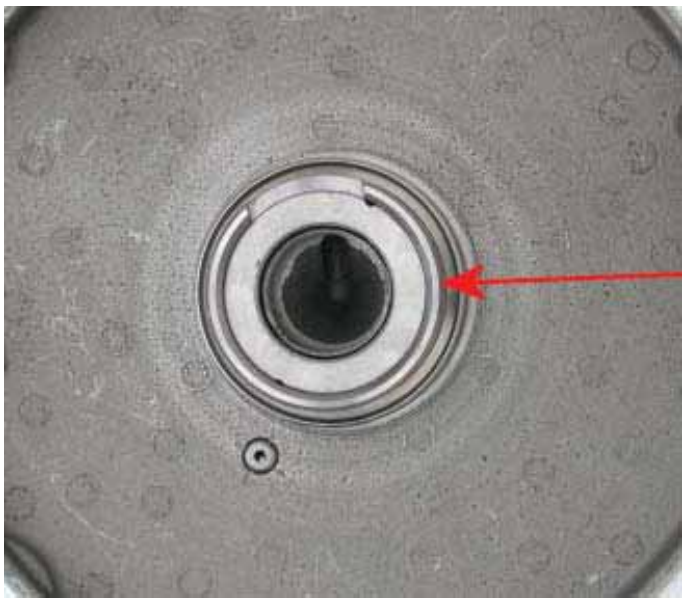
Mazda and Ford use two different types of End Covers. Madza End Covers have Hard Coat Anodized Aliminum Ring Lands. Ford End Covers have Steel Ring Lands. Mazda End Covers tend to fail in the Ring Land area because of the thin Anodized suface.

4F27E

End Cover Failure (continued)

Normal rebuilding procedure should include upgrading the Mazda type End Cover to the Ford type End Cover. This can be done with minor modifications.

Hard Coat Anodized Aluminum Cover (Mazda Applications)

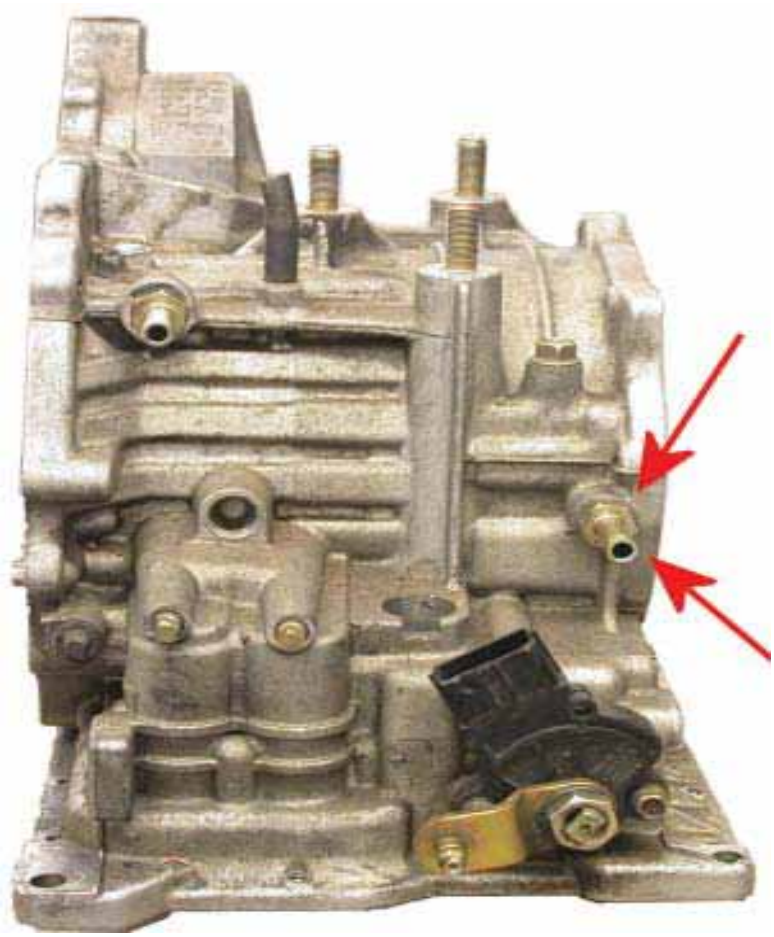


Pressed on Steel Sleeve (Ford Applications)

4F27E

End Cover Failure (continued)

When using a Ford cover on a Mazda application, the cooler return line must be relocated from the case to the end cover.



Mazda cases have the cooler return line located in the case

This Mazda fitting will NOT thread into the Ford cover

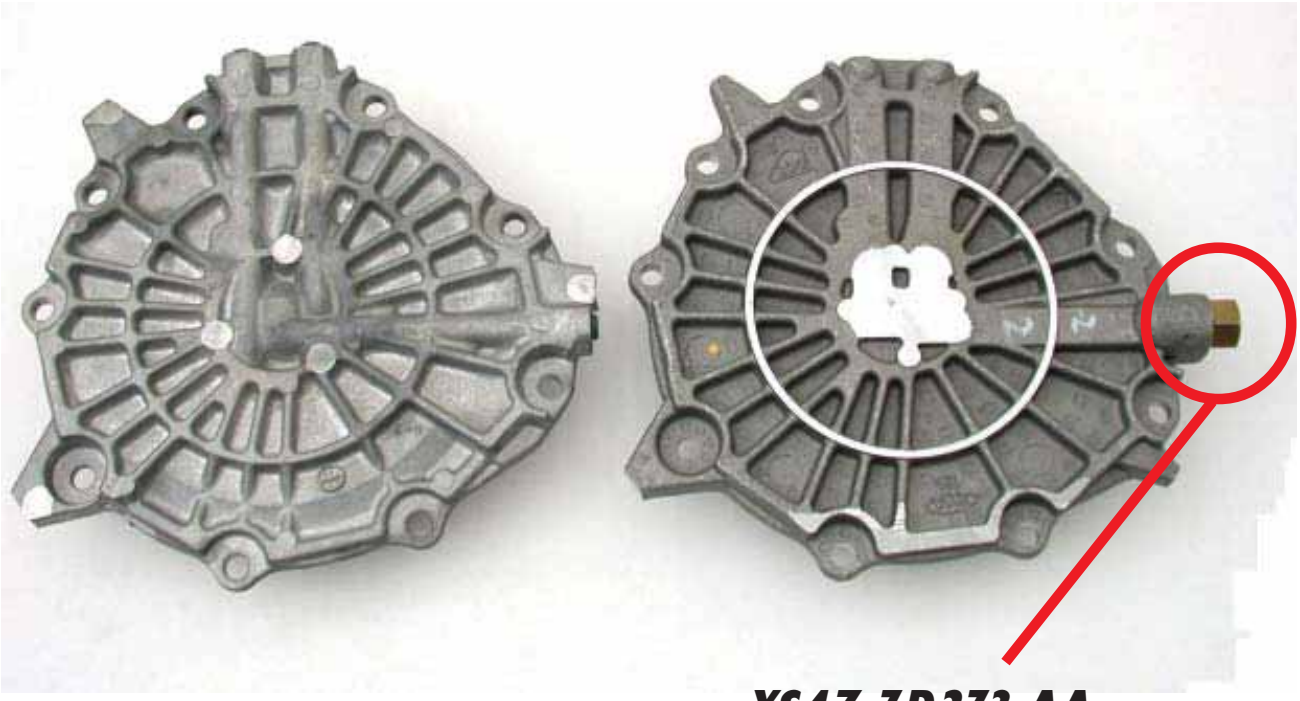
4F27E

End Cover Interchange

The first step is to install a 3/8” fitting adapter to the Ford cover.

Mazda Cover

Ford Cover
XS4Z-7222-BA

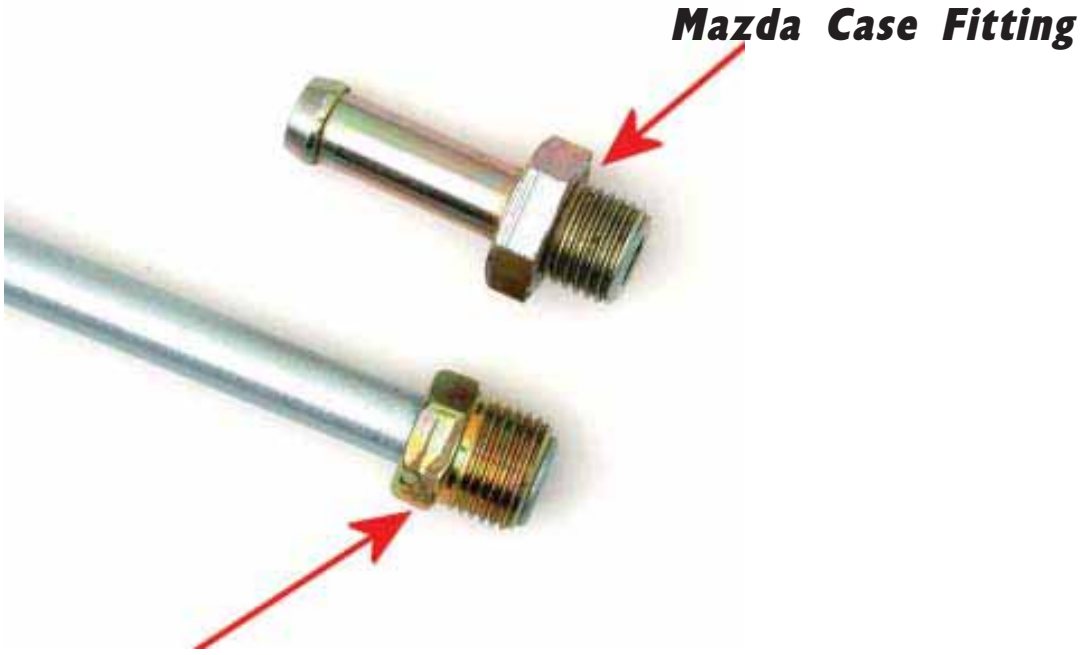


YS4Z-7D273-AA
3/8” Fitting Adapter
(sold separately)

4F27E

End Cover Interchange

Using a piece of 3/8" cooler line, cut and *bubble* flare the tubing to match the length of the original Mazda case fitting.



4F27E

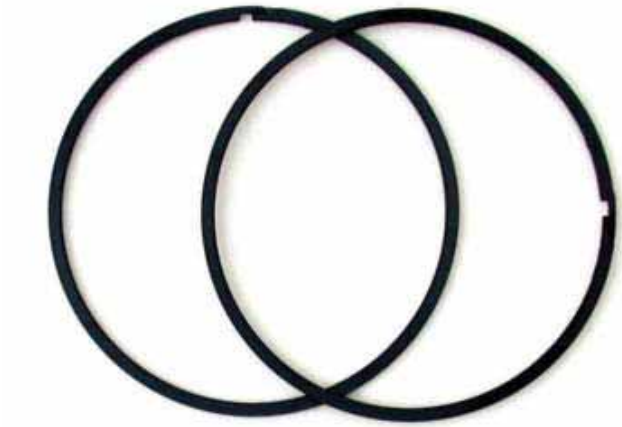
End Cover Interchange (continued)

Mazda cover **Ford cover**

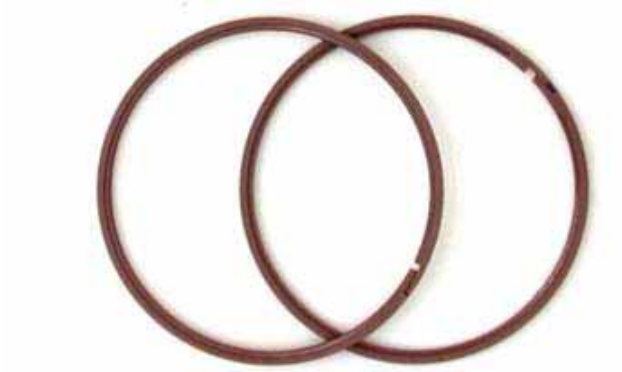
4F27E

End Cover Interchange (continued)

When useing the Ford cover always use the Ford Rings.



Reverse Clutch Rings
YS4Z-7D020-AA



Direct Clutch Rings
YA4Z-7D019-AA

4F27E

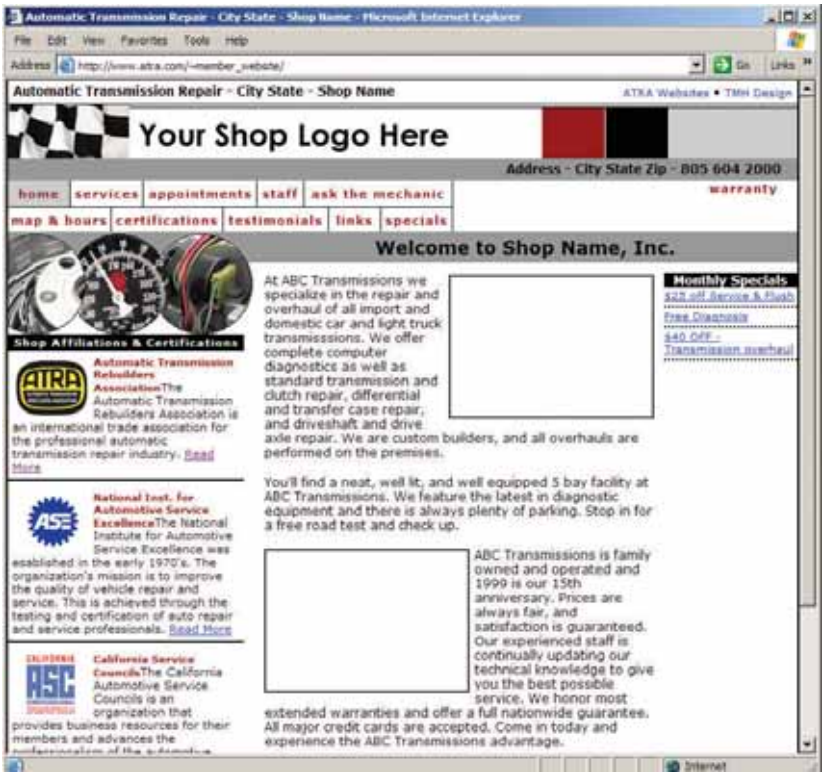
End Cover Interchange (continued)

When replacing hard parts, always check the end play. End play can be adjusted by replacing the selective washer.

End Play -0.010"-0.019"

0.062" XS4Z-7G262-FB
0.068" XS4Z-7G262-FC
0.075" XS4Z-7G262-FD
0.083" XS4Z-7G262-FE
0.091" XS4Z-7G262-FF
0.098" XS4Z-7G262-FG

Does Your Shop Have a Web Site?



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AX4S/AX4N

TCC Does Not Engage

NOTE: If the "TCCRAT" PID data is incorrect, the incorrect transaxle or drive and driven sprockets may have been installed in the vehicle

For DTC P0741 and P1744, check the resistance at the TCC solenoid. Make sure you have the right solenoid in place.

If the PCM commands the TCC "ON" and the TCC does not engage and you see a major slip on the PID's though your scanner, try to kill the engine in the stall. With the transmission commanded third gear and the parking brake applied, command the TCC ON.

***If the Transmission kills the engine check the command from the PCM.**
***If the Transmission does not kill the engine there are other areas you will need to check**

AX4S/AX4N

TCC Does Not Engage (continued)

If the Torque converter clutch does not engage when being commanded and/or Diagnostic Trouble Codes (DTC) P0741 or P1744 stored in memory, there may be many different problems associated with this. One of the more common problems is the bypass clutch control valve stuck in the bore.

When you start your diagnosis, use a scan tool to monitor PID's to help determine the proper steps to take for service.
The torque converter clutch may not engage if one or more of the following conditions exist:

1. Low Pressure
2 Stuck Converter Regulator Valve
3. Stuck Solenoid Regulator Valve
4. Stuck Bypass Clutch Control Valve
5. Stuck Pressure Failsafe Valve
6. Poor Pump Performance
7. Worn Pump Shaft or Damaged Pump Shaft Seals
8. Pump Shaft Internal Sleeve Loose (rattles)
9. Turbine Shaft Seals Damaged or Missing
10. Incorrect Torque Converter Clutch (TCC) solenoid
11. TCC Solenoid Mechanically Stuck or Electrically Inop
12. Damaged Internal Wiring Harness
13. Incorrect Gear Ratio (Wrong Sprockets)
14. Damaged or Worn Stator Support
15. Worn Torque Converter Hub Bushing
16. Torque Converter Clutch Worn or Damaged
17. Worn Bypass Clutch Contol Valve Bore
18. Worn TCC Regulator Valve Bore

Use a scan tool to monitor the following PID's:

1. TCC = Commanded Duty Cycle for the TCC Solenoid
2. TCCMACT = Actual slip across the TCC, measured in RPM
3. RPM = Actual engine speed
4. TSS_SRC = Actual turbine shaft speed
5. TCCRAT = Speed/Gear ratio of torque converter/transaxle

AX4S/AX4N

TCC Does Not Engage (continued)

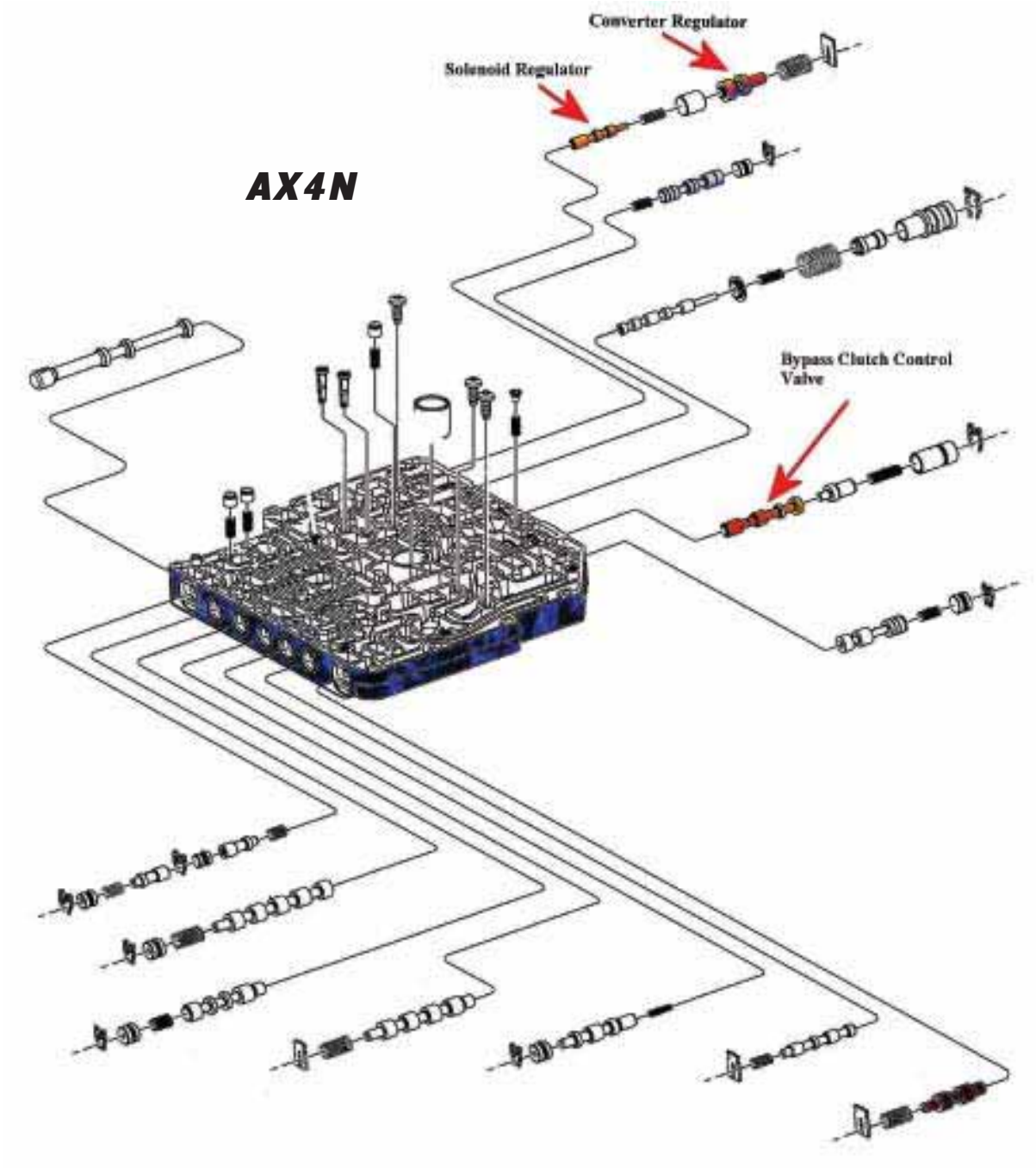
Check for pump shaft wear or damaged seals

Always inspect the pump shaft ring area, also look inside the shaft and make sure it has a inner tube and plug.

AX4S/AX4N

TCC Does Not Engage (continued)

Inspect the converter regulator valve, solenoid regulator valve, bypass clutch control valve and pressure failsafe valve

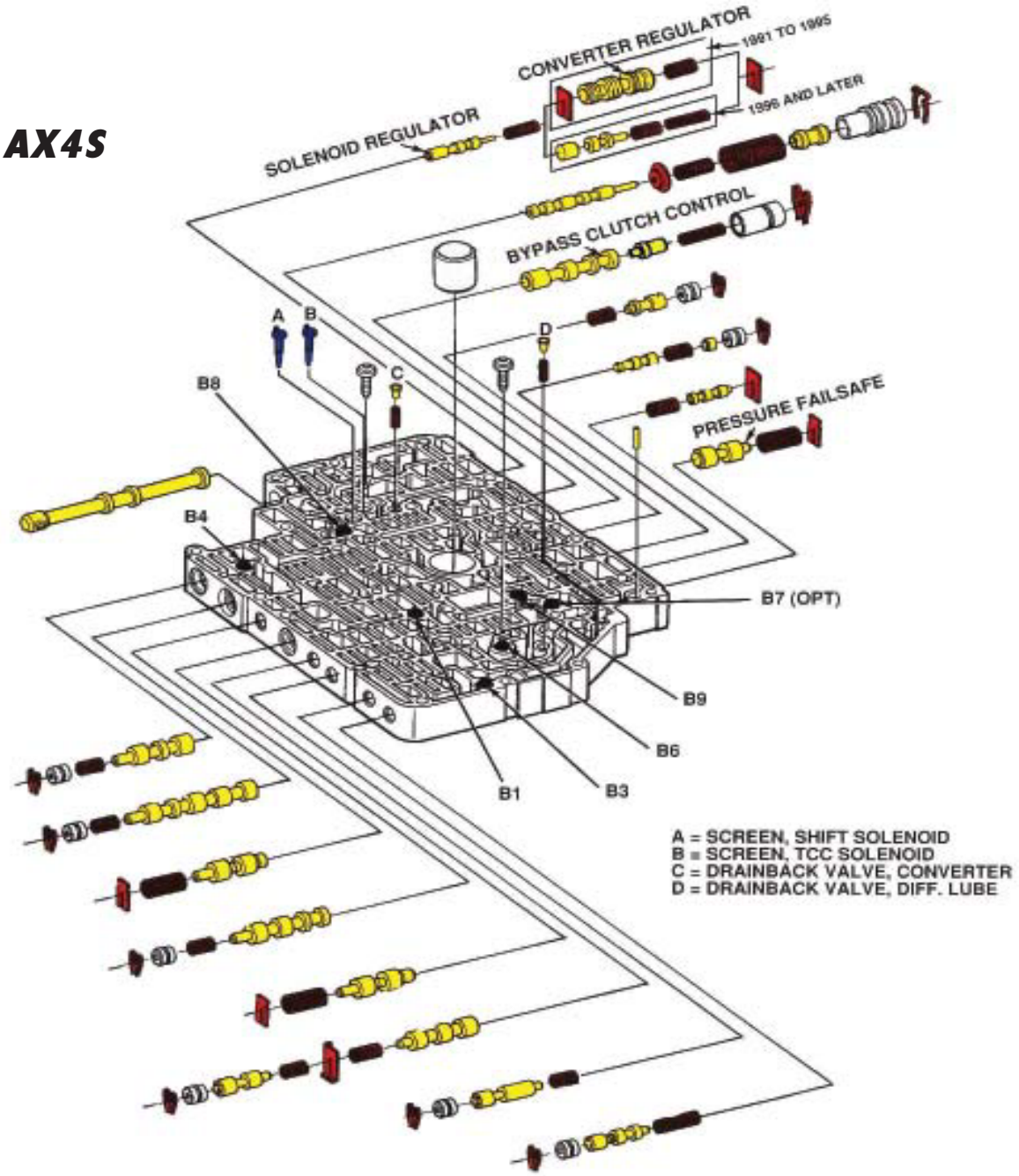


AX4S/AX4N

TCC Does Not Engage (continued)

Inspect the converter regulator valve, solenoid regulator valve, bypass clutch control valve and pressure failsafe valve

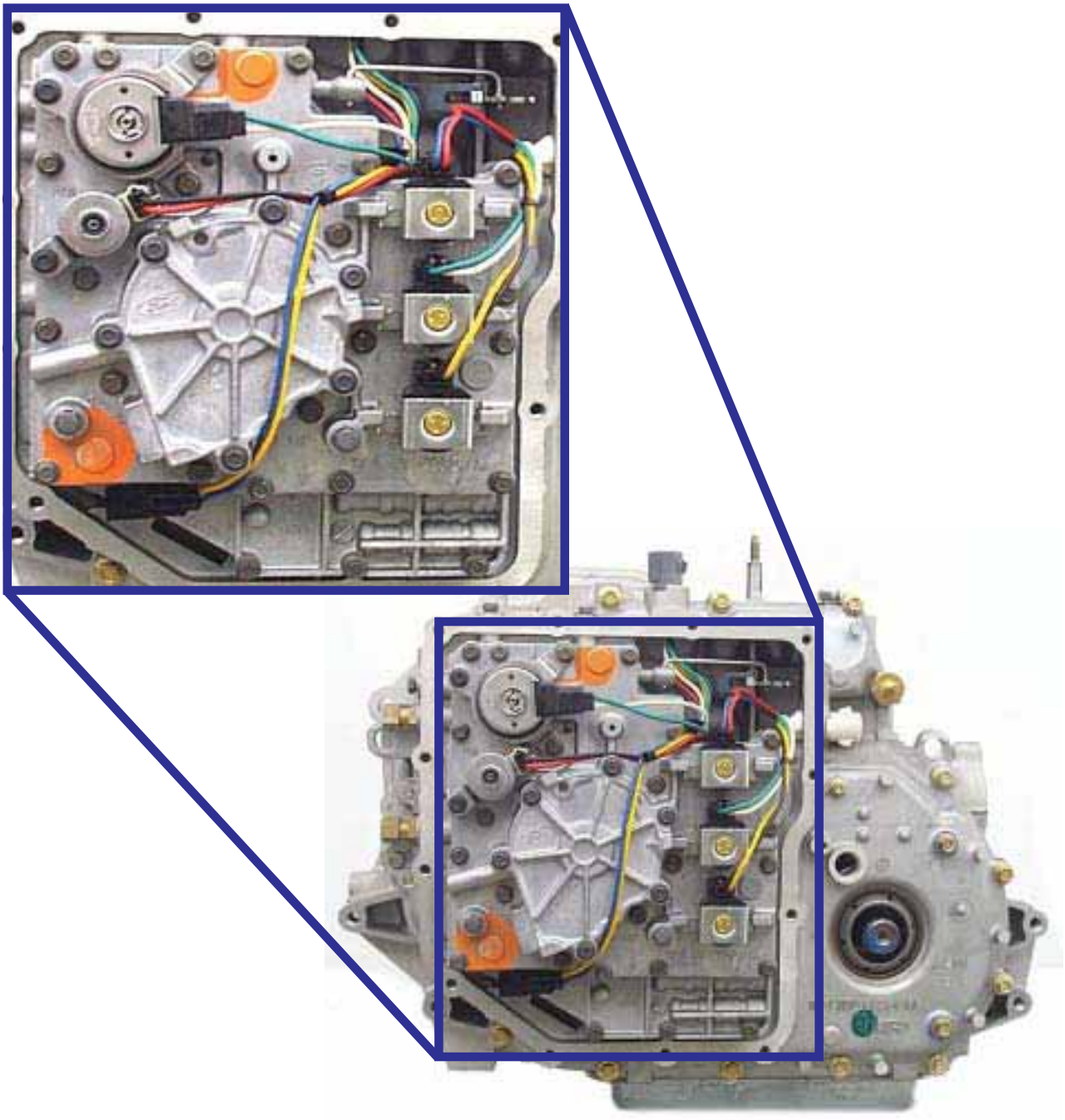
AX4S



AX4S/AX4N

TCC Does Not Engage (continued)

Inspect the internal wiring harness for damage

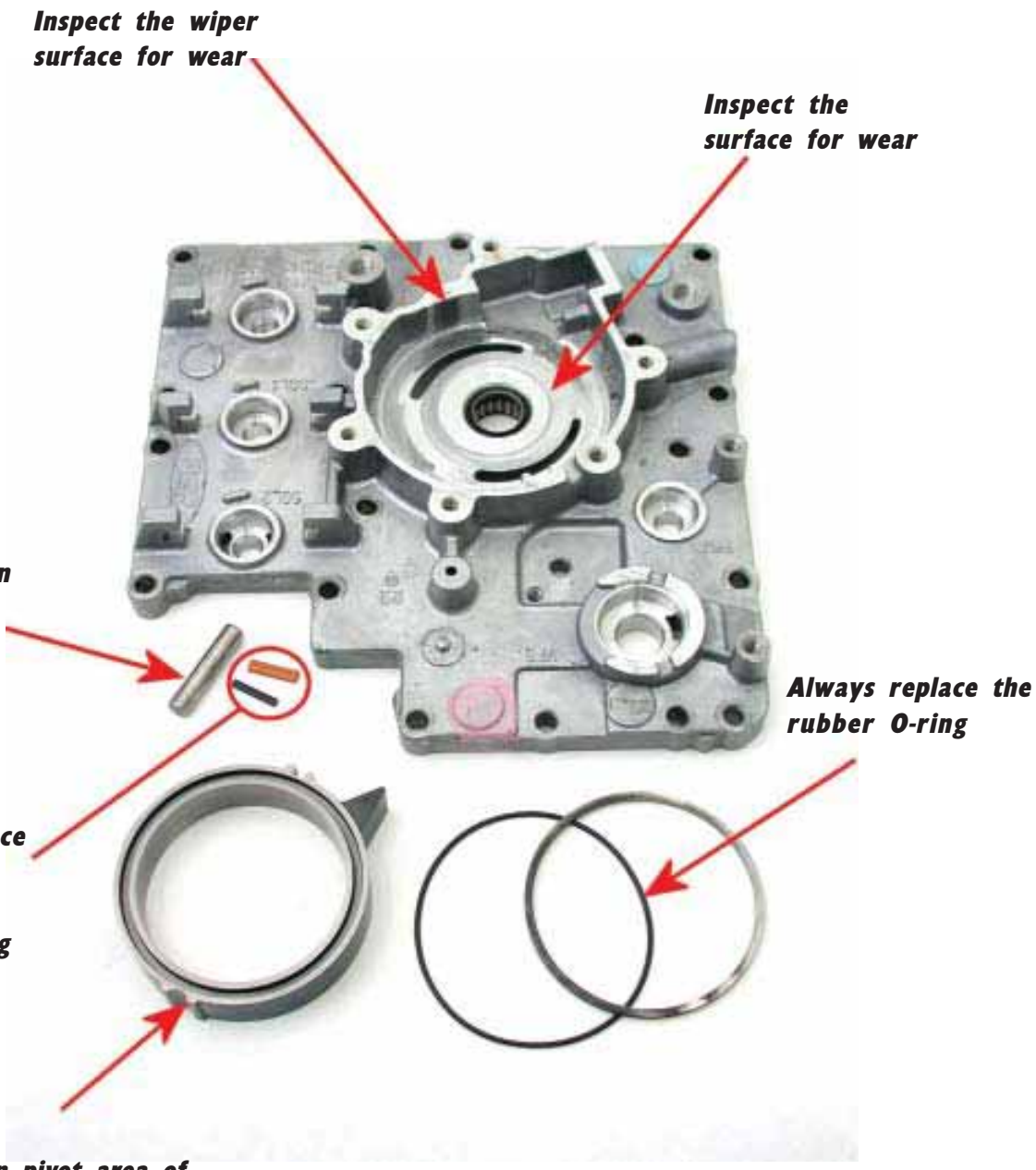


AX4S/AX4N

TCC Does Not Engage (continued)

Poor Pump Performance

Poor Pump Performance can be caused by wear or by not replacing the Teflon wiper, rubber spring, and rubber O-ring.



AX4S/AX4N

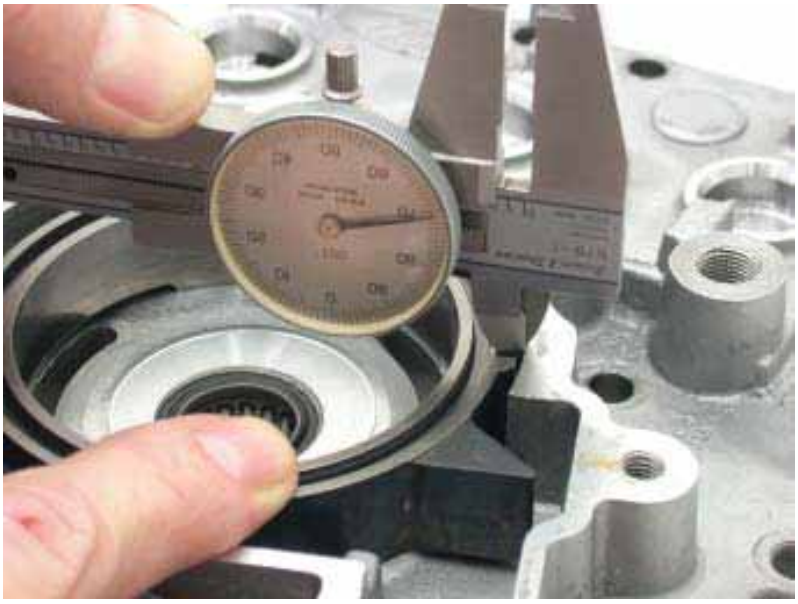
TCC Does Not Engage (continued)

Poor Pump Performance

The distance between the wiper groove in the slide and the wiper surface of the pump body changes depending on the position of the slide. Always replace the rubber spring and Teflon wiper during rebuild.

Measurement of the slide in the max position of its travel

Measurement of the slide in the center position of its travel



AX4S/AX4N

TCC Does Not Engage (continued)

Poor Pump Performance

As the slide moves, the angle of the wiper surface changes. This causes the Teflon wiper to flex the rubber spring. Over time this becomes loose.

Slide in the max position of its travel

Slide in the center position of its travel

AX4S/AX4N

TCC Does Not Engage (continued)

Poor Pump Performance

There are no factory specifications for pump clearances from Ford.

Rotor clearances should be 0.0015"-0.003"

Slide clearance should be 0.002"-0.004"

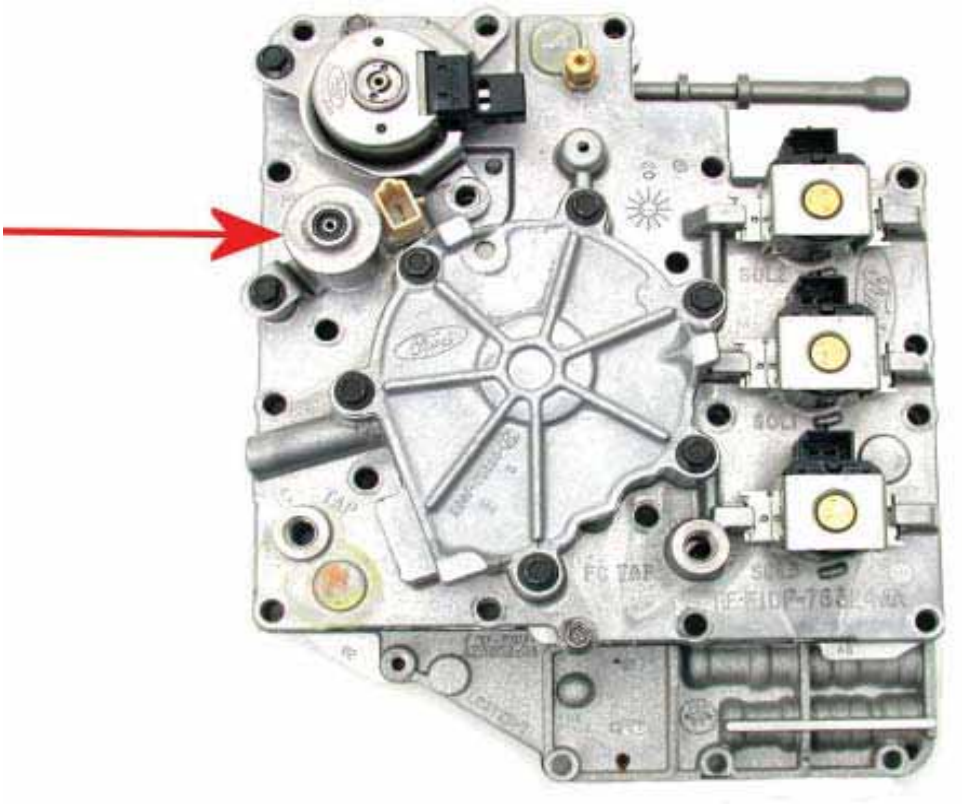
AX4S/AX4N

TCC Does Not Engage

Check the TCC Solenoid

The new TCC solenoid has a blue connector, the old solenoid is white. Do not interchange these solenoids, some calibrations have problems with the different solenoids and TCC ratio error codes will be present.

Always check the resistance of theTCC Solenoid to make sure you have the correct one.



Vehicle	Year	Date	Resistence
Taurus/Sable	1986-1990		20-40 ohms
Continental	1988-1990		20-40 ohms
Taurus/Sable	1991		21-36 ohms
Continental	1991-1996		0.98-1.6 ohms
Taurus/Sable	1992-1997		0.98-1.6 ohms
Windstar	1995-1998	Thru (9-8-97)	0.98-1.6 ohms
Continental	1997-2002		13-24 ohms
Taurus/Sable	1998-2003		13-24 ohms
Windstar	1998-2003	From (9-9-97) until the End of Production	13-24 ohms

AX4S/AX4N

TCC Does Not Engage

Inspect theTorque Converter Hub Bushing and Stator Support for wear
Inspect the Torque Converter Hub Bushing and the Stator Support for abnormal and excessive wear. If the Stator Support is worn and/or broken, check the torque converter splines in the bottom of the converter and the Stator Support splines. Both of the splines should have equal amount of teeth.

Torque Converter:
Hub outside diameter: ***1.991" (surface for the lip seal contact)***
Bushing inside diameter: ***1.657" (surface for the Stator Support)***

Stator Support:
Shaft outside diameter: ***1.652" (surface to TC bushing contact)***
Bushing inside diameter: ***1.079" (surface for the Turbine Shaft contact)***

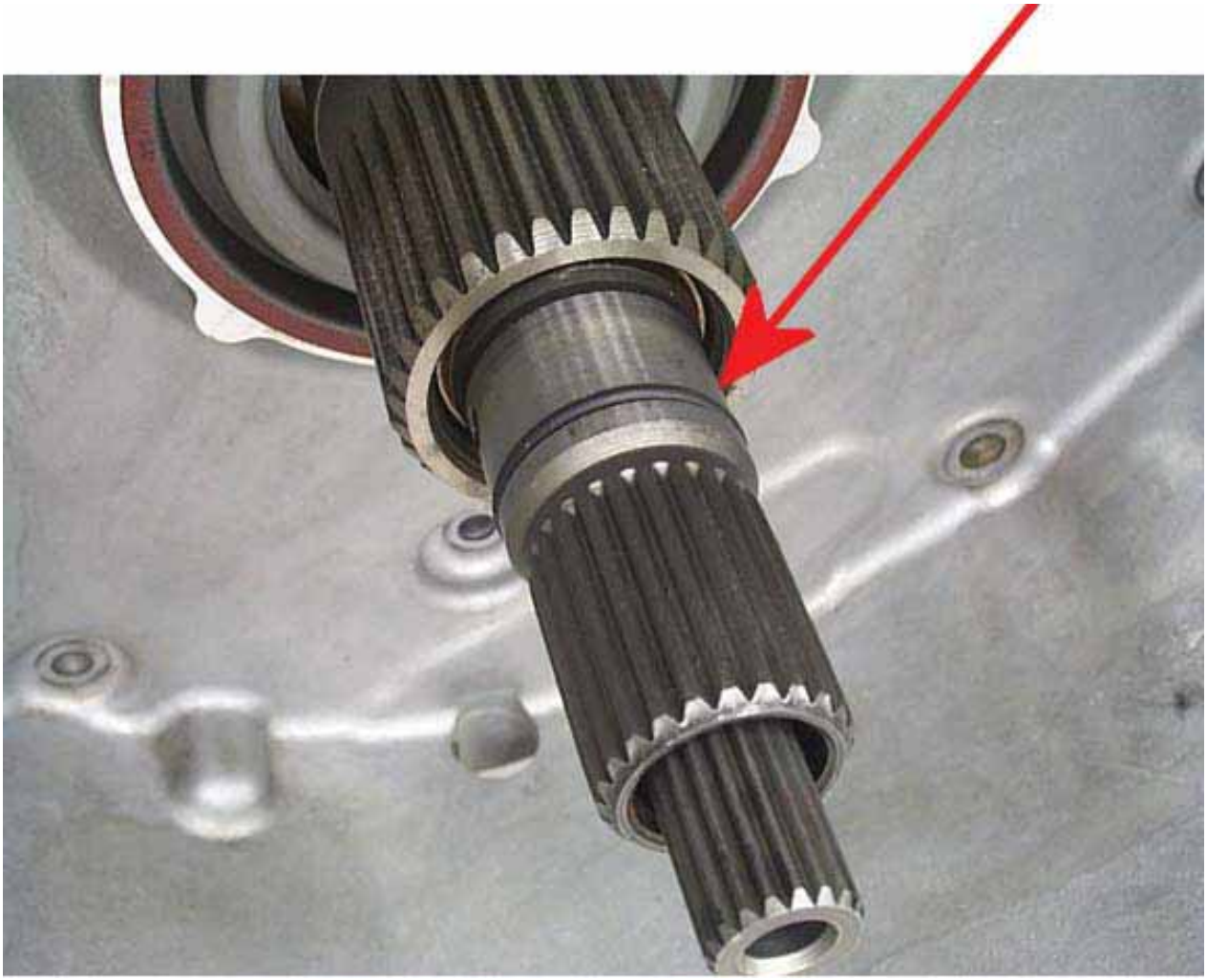
Turbine Shaft:
Outside diameter: ***1.076"-1.077" (surface for the Stator Support contact)***

AX4S/AX4N

TCC Does Not Engage

Inspect Turbine Shaft seals

The Turbine Shaft Seal is used to seal the apply side of the TCC. A worn, damaged, or missing seal will cause a slipping TCC application or a no TCC apply.



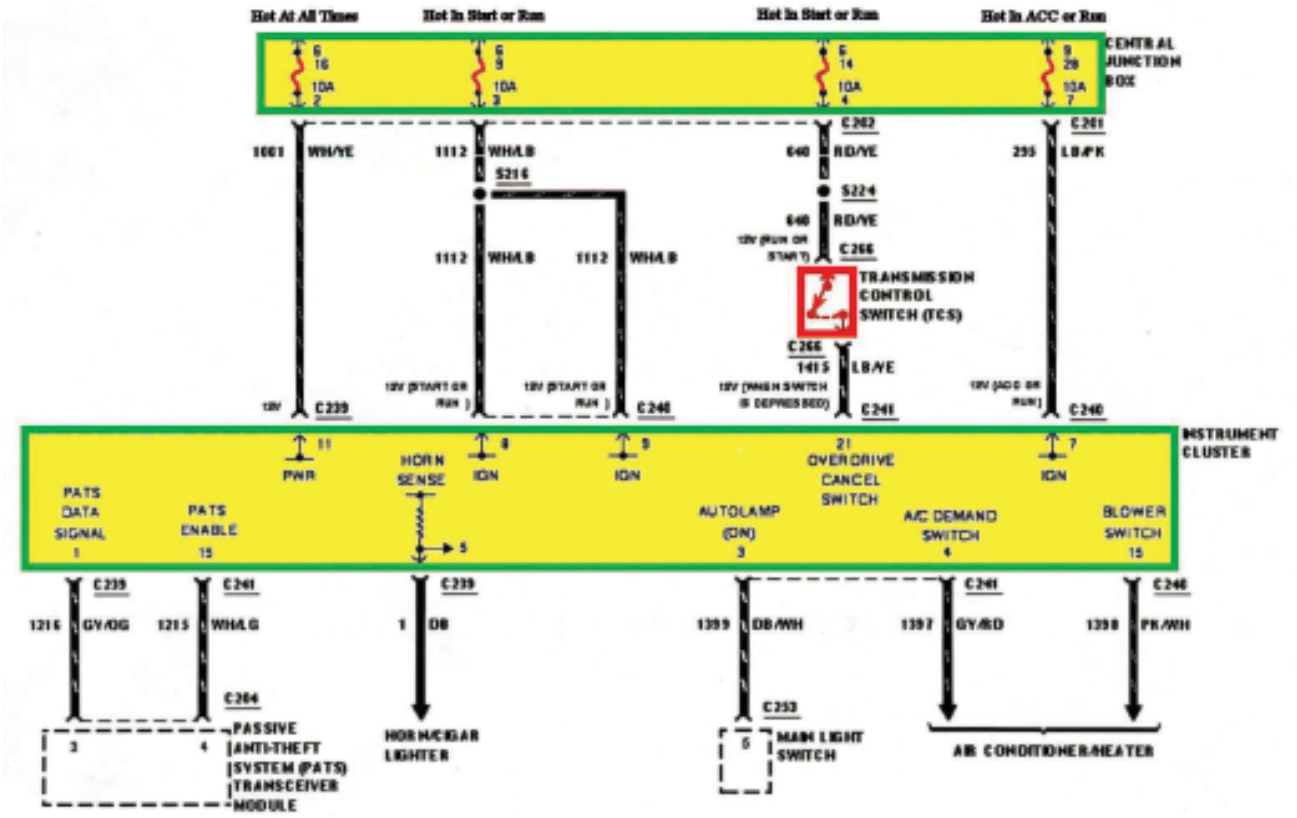
AX4S/AX4N

O/D Light Inoperative, Code P1780

Check Fuse # 14

A blown fuse in the engine compartment fuse box may be associated with this concern. Check for a chaffed wire in the steering column.

Models with an O/D cancel switch on the column are common, however finding a wiring diagram is not as common. Most late model Ford systems use a Multiplex system to communicate. The O/D cancel circuit is part of this system. When the user applies the switch, the command goes to the Instrument Cluster. From the Instrument Cluster the multiplex system tells the PCM to switch the solenoids to the third gear signal.



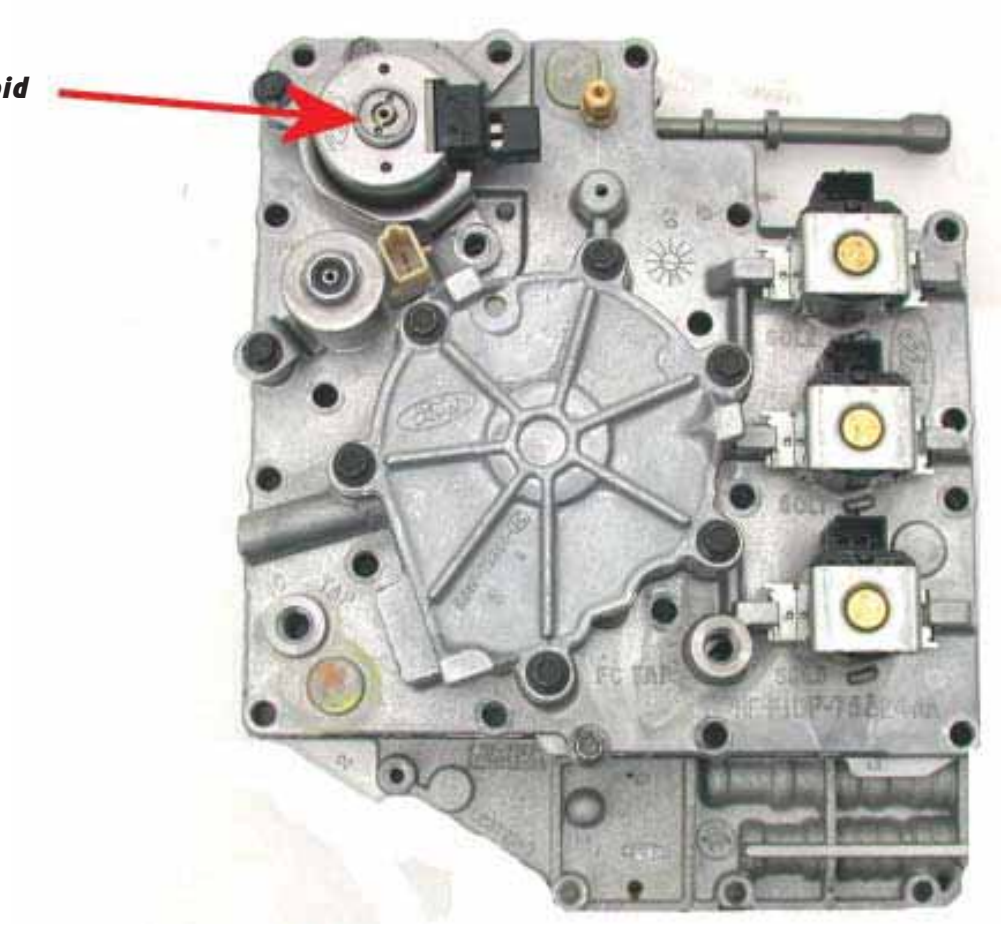
AX4S/AX4N

Erratic Mainline Pressure Rise

1996 Tauras/Sable, 3.0L 2V

Erratic line pressure can be caused by many thing, reprogramming the PCM or replacing the EPC Solenoid may not fix this problem. However, some 1996 model years with 3.0L 2V Taurus/Sable PCM's may not be able to be reprogramed using the factory scan tool (NGS). PCM part number F6DF-12A650-BF, F6DF-12A650-JD, F6DF-12A650-DF, & F6DF-12A650-KD were released with the same HEX file name programmed into the PCM. The F6DF-12A650-BF PCM can be reprogramed with the factory scan tool. PCM with part numbers F6DF-12A650- JD/DF/KD may not be able to be reprogramed with the factory scan tool. All four of these PCMs can be reprogramed using the July 98' or later program. If the factory scan tool is unable to reprogram the PCM it is neccessary to replace the PCM assembly.

EPC Solenoid



ZF6HP26

Expedition/Navigator

This transmission uses planetary gears with hydraulic electronic controls. The transmission control module (TCM) and the main control valve body units form a composite element that is installed as a single unit inside the automatic transmission.
This transmission has the following features:

- Six forward speeds
- Torque converter with an integral converter clutch
- Electronic shift and pressure controls
- Single planetary gear set
- Double planetary gear set
- Two fixed multi-disc clutches
- Three multi-plate clutches

All hydraulic functions are directed by electronic solenoids to control:

- Engagement feel.
- Shift feel.
- Shift scheduling.
- Modulated torque converter clutch (TCC) applications.

This transmission has a mechatronic unit also referred to as a transmission control module (TCM) which contains:

- Turbine shaft speed (TSS) sensor
- Output shaft speed (OSS) sensor
- An internal P, R, N, D selector shaft position sensor
- Transmission fluid temperature (TFT) sensor

ZF6HP26

Expedition/Navigator

Engine power reaches the transmission by a torque converter with an integral converter clutch. The six forward gears and one reverse gear are obtained from single planetary sets.

This automatic transmission is a six-speed electronically controlled transmission comprising the basic elements of a TCM, main control valve body unit, torque converter, one solenoid valve and six pressure regulators. Gear selection is achieved by the control of automatic transmission fluid flow to operate various internal clutches. The TCM operates the electrical components and provides for the control of gear selection shift pressure which increases refinement and torque converter slip.

In the event of a system fault, the TCM also provides for failure mode effect management (FMEM) to maintain maximum functional operation of the transmission with a minimum reduction in driver, passenger or vehicle safety. In the event of a total loss of control or electrical power, the basic transmission functions PARK, REVERSE, NEUTRAL and DRIVE are retained. Also third or fifth gear is retained by the hydraulic system. The gear retained is dependent upon the gear selected at the time of the failure.

ZF6HP26

Expedition/Navigator

Solenoid Application Chart								
Gear	SS A (EDS1)	SS B (EDS2)	SS C (EDS3)	SS D (EDS4)	PC A (EDS5)	TCC (EDS6)	SS E (MV1)	REV (MV3)[a]
PARK				X	a			
REVERSE		X		X	a			b
NEUTRAL				X	a			
First gear manual	X			X	a	a		
Second gear manual	X		X		a	a		
Third gear manual	X	X			a	a		
First gear D6/D4	X			X	a	a		
Second gear D6/D4	X		X		a	a		
Third gear D6/D4	X	X			a	a		
Fourth gear D6/D4	X			X	a	a	X	
Fifth gear D6/D4		X		X	a	a	X	
Sixth gear D6/D4 (Overdrive)			X	X	a	a	X	

ZF6HP26

Expedition/Navigator

Clutch Application Chart					
Gear	Forward (A)	Direct (B)	Intermediate (C)	Low/ Reverse (D)	Overdrive (E)
PARK				X	
REVERSE		X		X	
NEUTRAL				X	
First gear (M) manual	X			X	
Second gear manual	X		X		
Third gear manual	X	X			
First gear D6/D4	X			X	
Second gear D6/D4	X		X		
Third gear D6/D4	X	X			
Fourth gear D6/D4	X				X
Fifth gear D6/D4		X			X
Sixth gear D6/D4			X		X

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FIXES CONVERTER OVERHEAT, HIGH LINE PRESSURE, CODE 62, 628

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22771A-02K

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22000-01K

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