

SK[®] AXOD-C Shift Kit[®]

1986-91 Lube and Calibration Upgrade

Identification: If valve body has one solenoid this is the correct kit. If valve body has five solenoids order SK[®] AXODE kit.

Give this trans something it never had before:

Positive lube to front planet gears.
This upgrade reduces planet burnup.

It also corrects/reduces the following complaints:

Slide 1-2 when hot—No max 1-2 hot—Hot light throttle 2-3 cutloose
 Kickdown cutloose/bang under 25 mph—2-3 slide at high throttle
 Cutloose and clangs at low speed—3-4 long slide with a bump
 Gumpy 3-2 kickdown—No 4th, or falls out of 4th when hot
 Lockup plate glazing—Can't feel lockup—Rough "N" to "D"
 1-2 band breakage—2nd and 3rd clutch burnup—Rough 1-2 cold

There's often a difference between why the vehicle came in for repair [planet burnup, broken band, no upshifts] and the complaints that show up *after* repair. This can be painful, because just another quick glimpse inside can take a day; and if you don't see anything wrong, right off, another 3 days is average.

Most after-repair complaint are caused by under tightened bolts, VB alignment, friction plate quality, assembly errors, such as wrong plates and gaskets, checkballs, and poor quality or low boiling point fluid.

This kit reduces/corrects cold 1-2 bang, no high throttle 1-2 shift when hot, light throttle 2-3 cutloose, and the runaway with a bang during kickdowns under 30 MPH. [The runaway bang is what we believe causes the 1-2 band to break.

A casual 3 to 10 block road test will not usually reveal these complaints: But a long upgrade, or hot stop and go traffic brings them out in full force for your customer. Your attention to the instructions will prevent them.

This upgrade discontinues some systems that tend to malfunction, and replaces them with more reliable systems.

Hand-sand the 2nd gear steel plates and the forward and 4th drums with fine emery to assure long term shift quality and cool break-in. [Yes, sand steel plates even if they are new].

Product Support: (626) 443-7451

It's a long way back in. Call, we will help.

Max pressure: At stall in "D" should be 185 to 212 psi on all models.

Min regulated pressure: At 40 mph in "3", lift throttle, should be 70-91 psi.

Min pressure at HOT idle: 52 psi; and must increase to 80-91 at twice idle speed.

Upgrade brings all year models to 3.8 pressures and capacity. This will allow more interchange freedom between years/models.

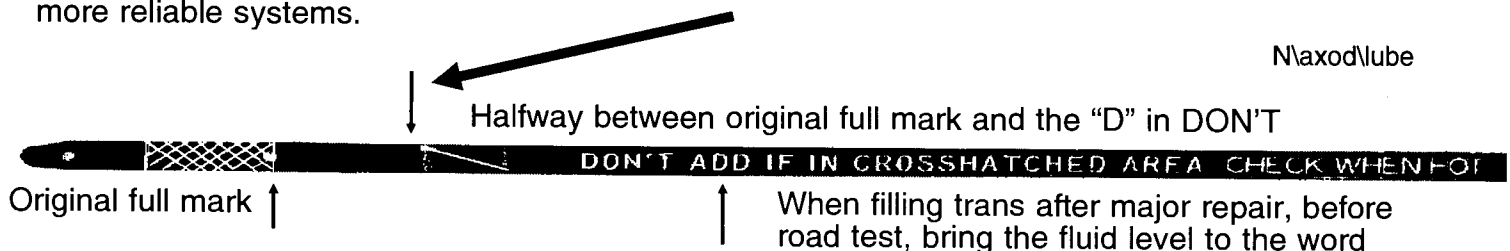
Type of fluid (boil and flame resistant) and fluid level is critical to avoid failure:

Use 8 qts of synthetic ATF, and finish the fill with Dexron II. Original level is not enough to prevent air on corners or curves.

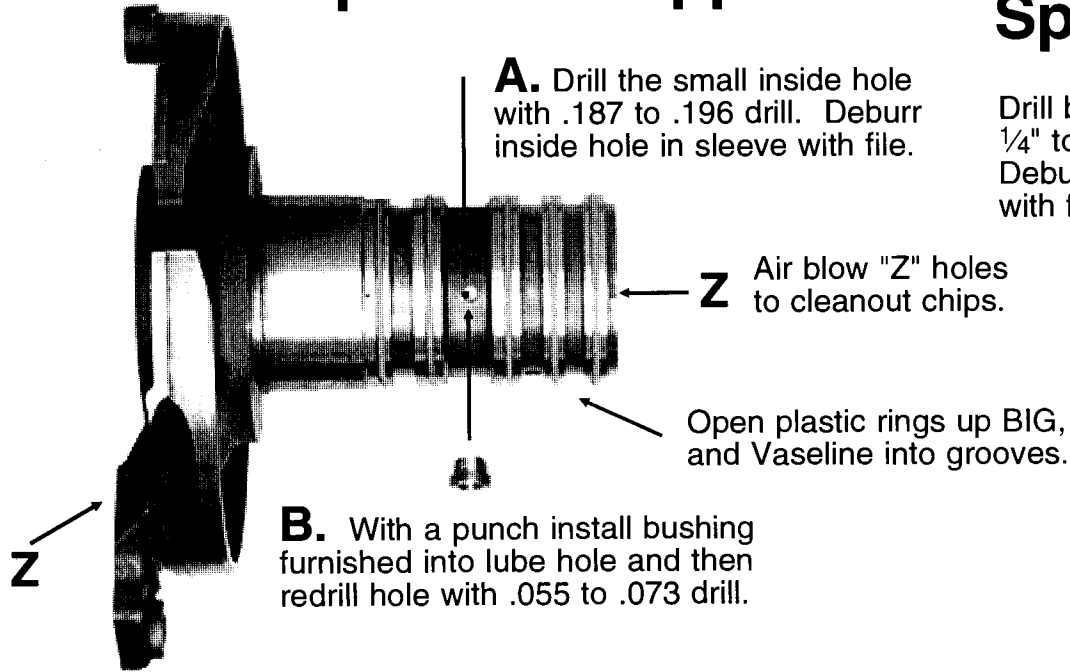
Too much causes whine noise.

Use NEW FLUID LEVEL: $\frac{1}{2}$ to $\frac{3}{4}$ " above the full mark. **Check level at twice idle speed in Park after HOT road test.**

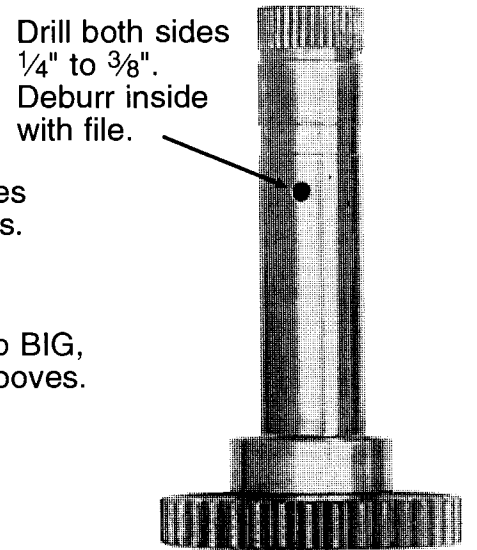
N\axod\lube



Sprocket Support

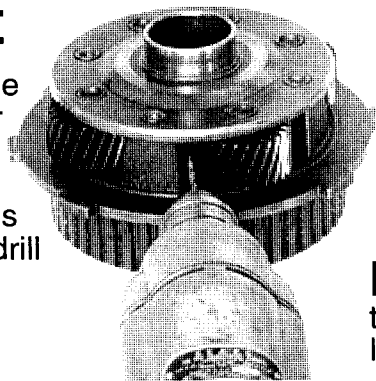


Sprocket Shaft



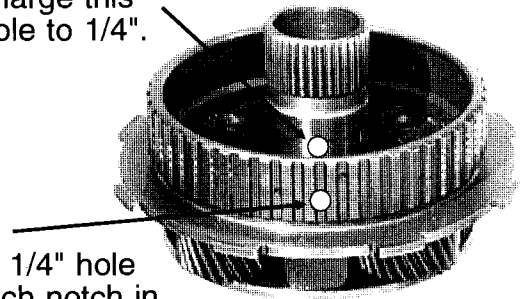
Front Planet

A. Drill up high under the cover past the planet gear to enlarge two holes with the .110 drill furnished. If you can't reach the holes to drill them, it's OK, just drill two new .110 holes.

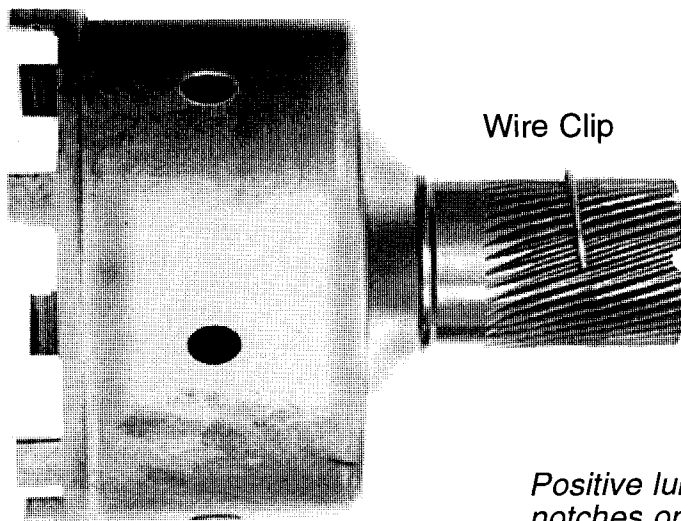


C. Enlarge this lube hole to 1/4".

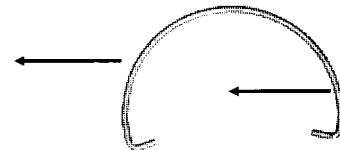
B. Drill a 1/4" hole thru a clutch notch in line with lube hole.



Sun Gear



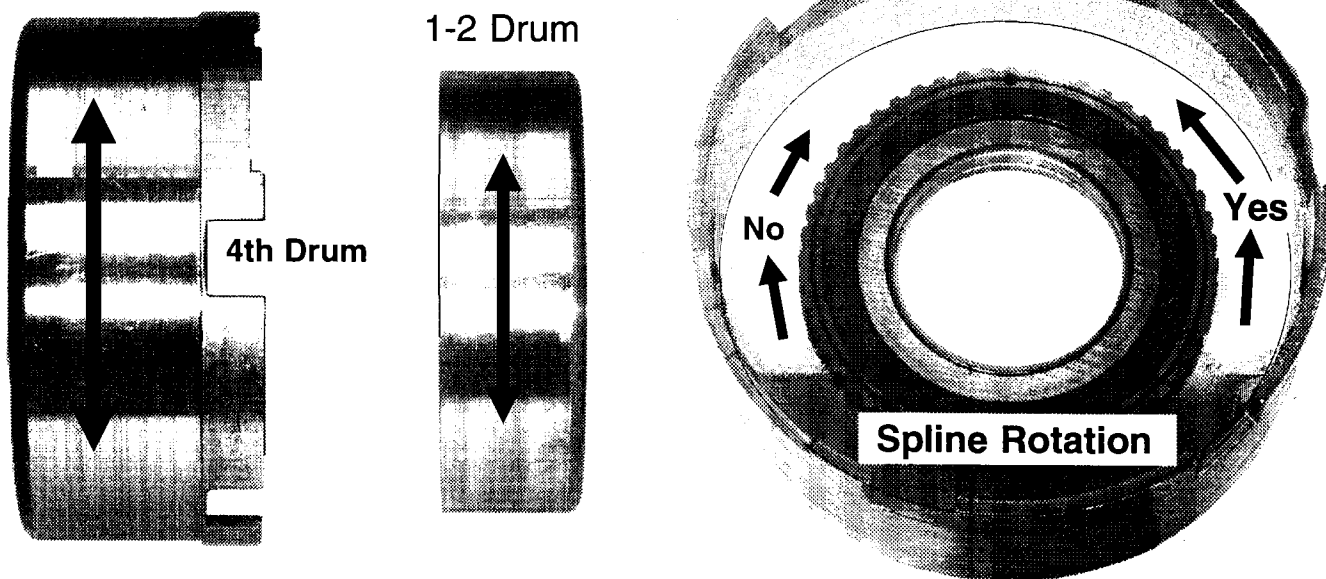
A. Grind two notches 1/32" to 1/16" deep on the end of the sun gear. Don't worry: It's not fussy.



B. Slide the wire clip over the end of the sun gear to align with the holes and insert the ends into the spray holes.

Positive lube flow now squirts out of the notches on end of sun gear directly onto the planetary gear teeth and the needle bearing.

Useful Methods: Sand 4th and 1-2 drum around and around with 180 or finer emery to break the glaze. This will assure a fast break-in with a new band and knock the glaze off of a used band.



Assembly: With Stone Age Engineering™

1. Install all the planets, the reverse clutch and the reverse clutch housing into the final drive. [The reverse clutch housing looks like a center support.]

Don't install 4th band.

2. Stack forward, 2nd and 3rd clutch packs, and the 4th drum into the sun gear shell.

Then install the sprocket support.

3. Loop safety wire to the right of sun gear, to the left of the pad, and through the notch as shown.

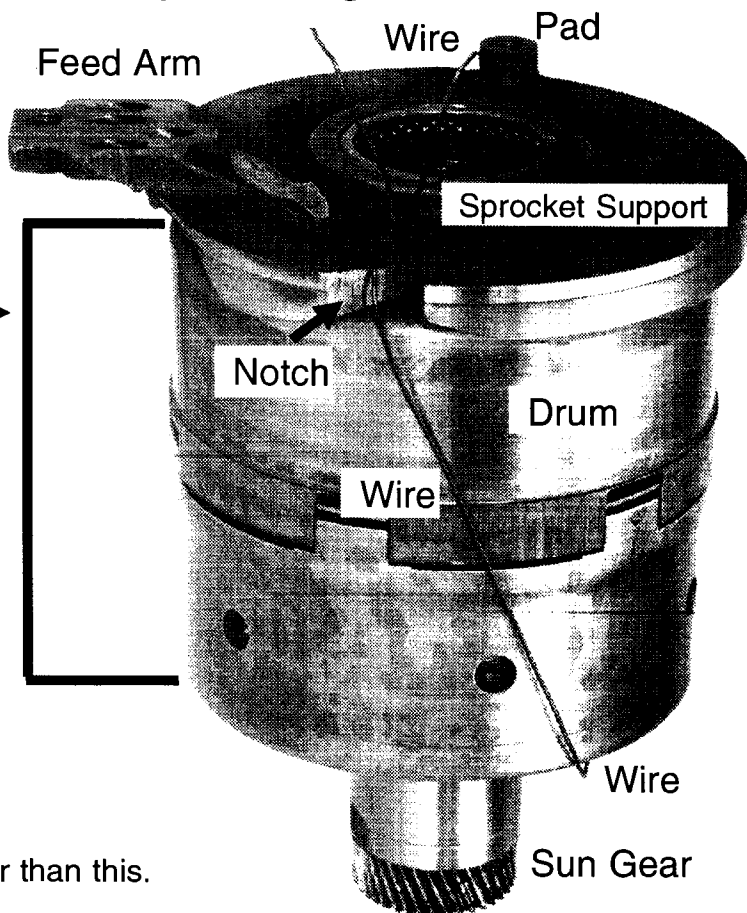
4. Rotate the manual valve shaft until parking pawl rod is sticking out of the case. This will give more room for assembly.

5. Insert the whole assembly into the case. Cut the wire and pull it out. While holding drum in place through the notch, remove sprocket support.

6. **Install the 4th band.**

7. Re-install sprocket support.

8. Smile; it don't get no better than this.

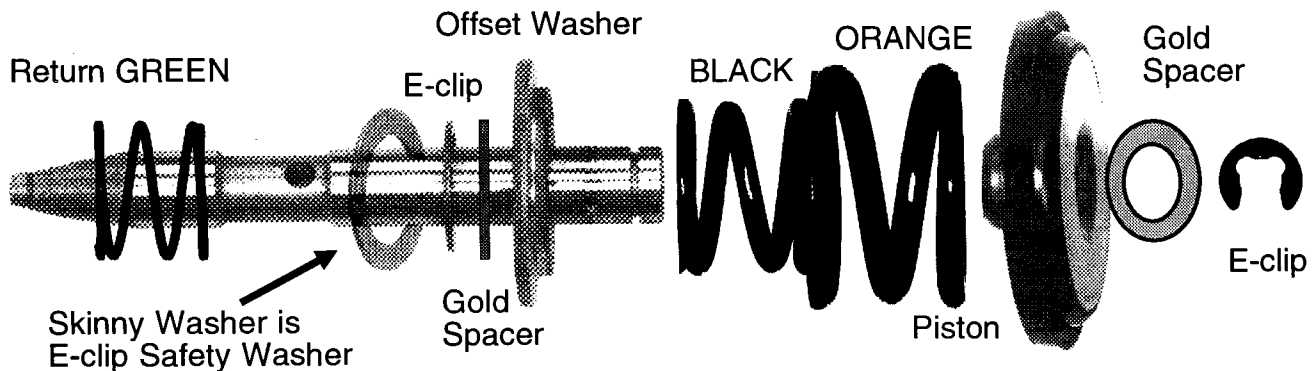


Suggestion: Now is a good time to install the 4th servo, while you can hand wiggle the band to make sure it has some clearance.

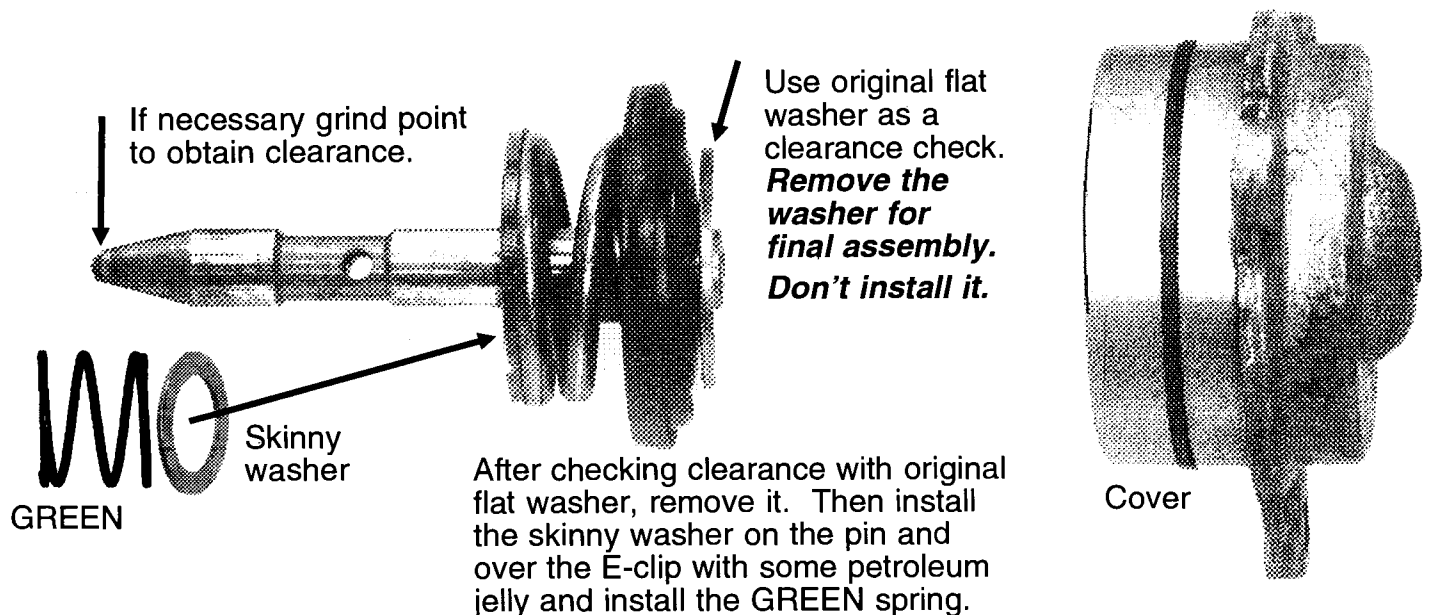
4th Band & Servo Assembly

With chain cover removed: Discard original springs, spring seat and flat washer. Swap the "E"-clips. [Middle "E"-clip is often opened/fatigued. The end one is good as new.] Assemble in this order: E-clip, gold spacer, offset spring seat, BLACK and ORANGE cushion springs, piston, gold spacer, E-clip. Install skinny washer over the center E-clip and into the offset spring seat with a small amount of petroleum jelly, so it will stick there during the installation. Install the GREEN return spring.

Insert the whole assembly into the case and install the cover. Check clearance by reaching into the case to wiggle the band---Or rotate the 4th drum to see if it is free. Clearance is not critical, but it must have some. If band is too tight grind the point end of the pin 1/16".

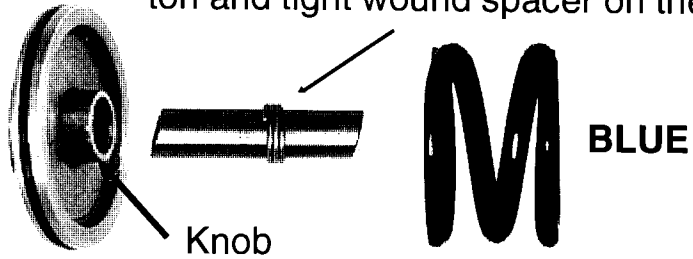
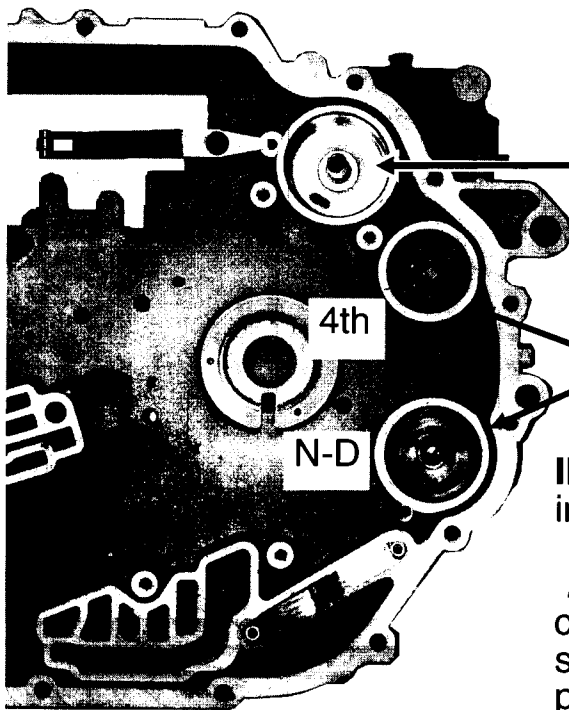


With chain cover installed: Assemble as shown above. Then place original flat washer on end of pin, on top of the E-clip. Install the assembly into the case without the GREEN return spring. The cover must install flush with the case with one finger pressure. If cover won't go flush with one finger, grind the point end of pin 1/16". After adjusting clearance, remove the original flat washer and install the GREEN spring.



2nd Accumulator

With Vaseline or Gel install pin into piston and tight wound spacer on the pin..



Reinstall 4th accumulator pistons and springs even though its function is not required,

IMPORTANT: Before putting cover into parts cleaner install a spring and the piston to protect the bores.

Prevent gasket blowout. Glue gasket to the chain cover with a hardening type, rubber cement. Also put some cement on the case. Ford D7AZ-19B508-B is perfect. Tighten bolts easy and slowly several times.

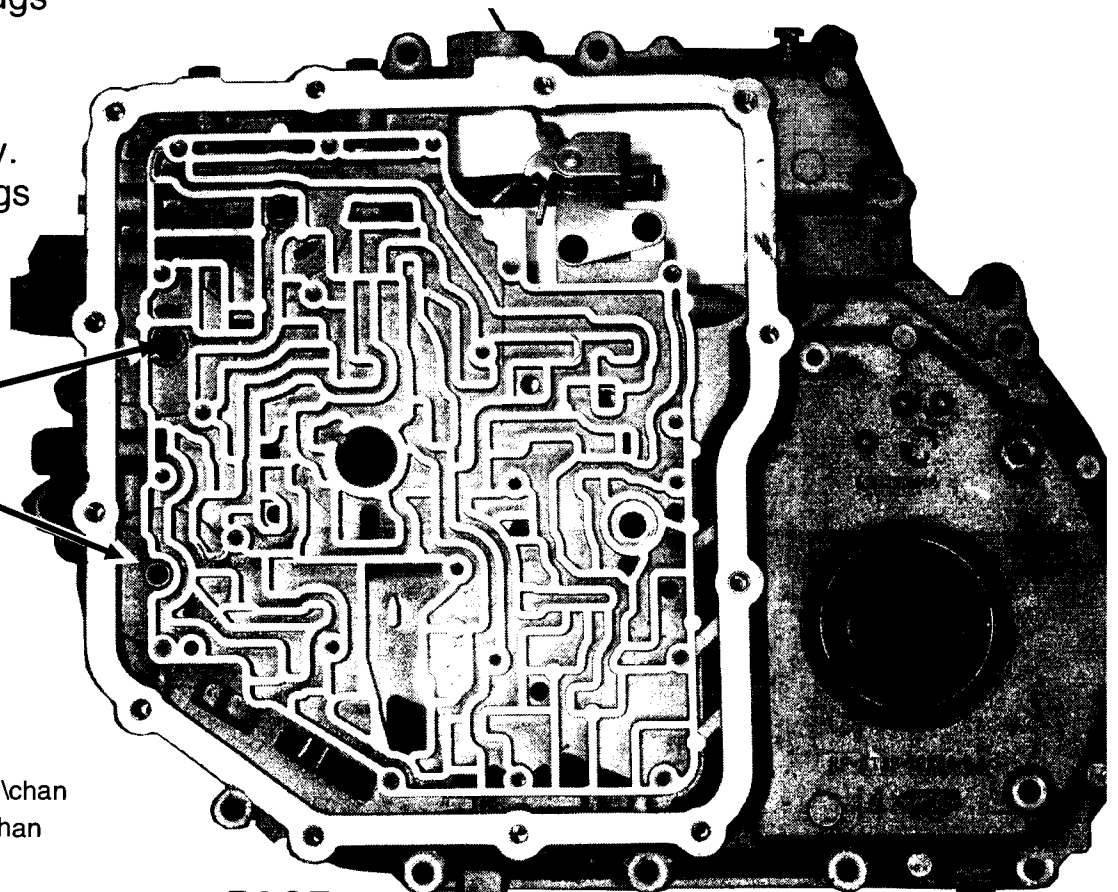
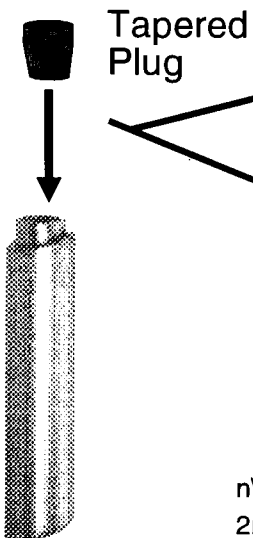
N\axod\2ndac

Input & 4th Accumulator

“Smart” 1-2 servo corrects the “gump” and double bump from neutral to drive. New 4th servo cushion system corrects the long slide during the 3-4 upshift.

Install tapered plugs into the input and 4th accumulator feed pins.

Tap plug in gently. Don't worry if plugs are loose or tight; it won't matter.



n\axod\chan
2nd&chan

Valve Body Plate

Open the bag that contains the alum slug.

Drills furnished are .055; .110; 3/16 (.187)

A. Enlarge these two holes with the small drill furnished (.055).

B. Drill .110 - .116"

C. Drill these three holes 3/16" [.180 - .190]

D. Enlarge this hole with .076 to .086 drill
Drill not furnished

If this location is a slot leave it as is. If a hole drill to 3/16" [.180-.190].

Checkballs must not fall through this hole.

What it does: Furnishes shorter converter apply and release to reduce lockup plate glazing. Changes the kickdown system to match the new servo parts for preventing 3-2 and 3-1 kickdown cutlooses and bangs. Alum slug discontinues original 3rd apply system, which is now controlled by the 3rd orifice check valve.

Don't grease checkballs: Use Vaseline or assembly gel.

Pump Plate

Checkballs must not fall through this hole.

B. Pump Control:
Drill 3/16" [.180-.190]

A. 3-2 control:
Use .055" drill.

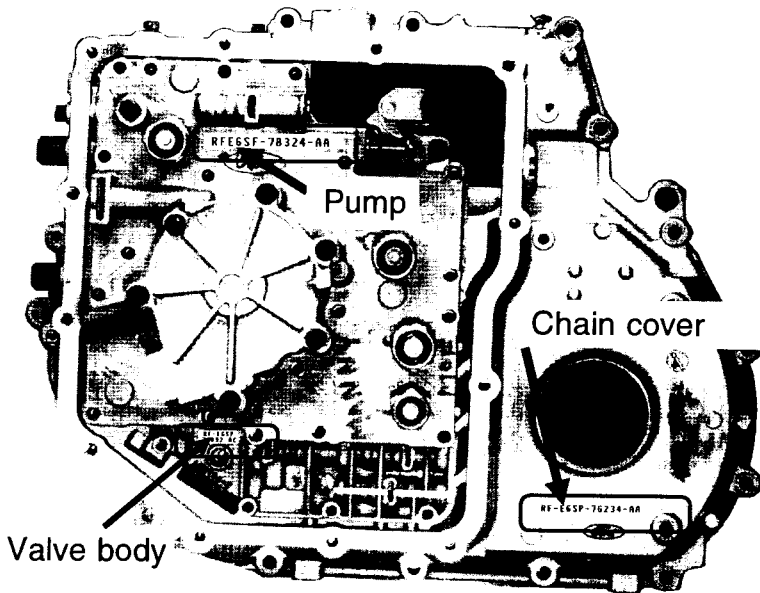
C. 3-1 Exhaust: Hole should be .150 to .213. If it needs enlarging, use large drill furnished. Then smack it on both sides with 5/16 or 3/8 steel checkball to deburr it and reform hole.

D. Alum slug furnished:
Place plate on cement floor or thick steel work bench. Insert alum slug in hole and smack it twice smartly with a hammer.
File slug flush on this side.

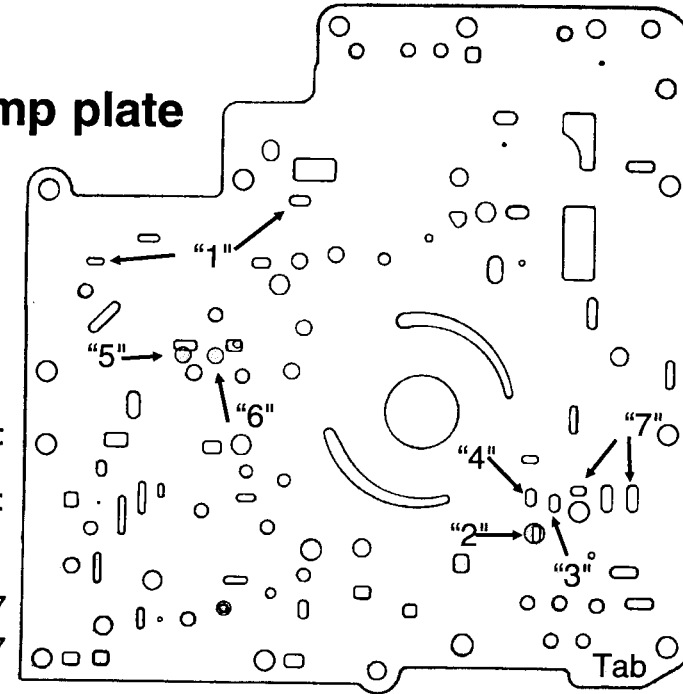
Before starting VB and pump upgrades and assembly, *circle casting codes* the trans has on the chart below. *You need to know them later.*

VB Plate	Valve Body & Gaskets	Pump/Plate/Gaskets	Chain Cover
86 type:	E6 PLAIN	E6 86 PLAIN	E6
87 type:	E7 WHITE	E6 87 WHITE	E7
88 type:	E8 YELLOW	E8 88 YELLOW	E8
90 type:	E9 YELLOW	E9 90 BLUE	E8

These are the parts that match and the color code for the gaskets:



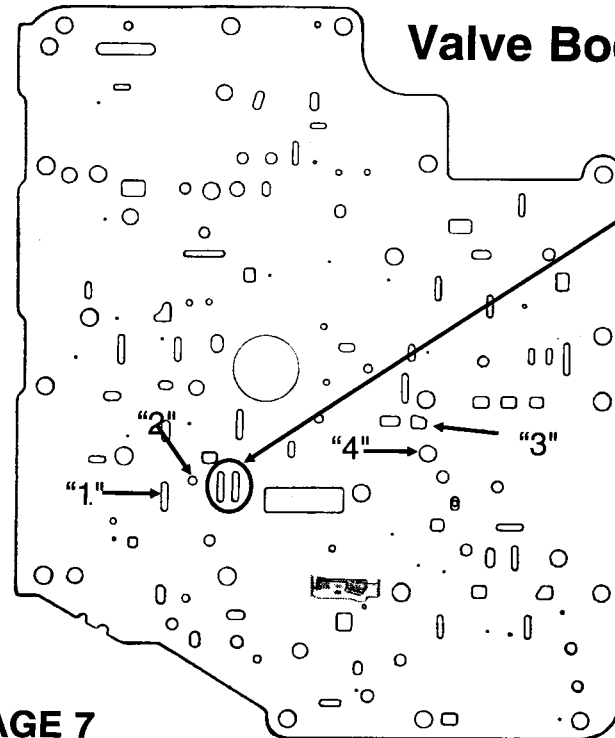
Pump plate



Pump plate identification Circle the type trans has:

- 86type: With 3-land accm valve:
Has holes 1-2 & 3
- 86type: With 4-land accm valve:
Has holes 1-2-3 & 7
- 87type: Has 3; No 1-2-4-5-6-7
- 88type: Has 2 & 4; No 1-3-5-6-7
- 90type: Has 2-4-5 & 6; No 1-3-7

Valve Body plate



Valve body plate identification. Circle the type trans has:

- 86type: Has dual slots circled
- 87type: Has 1 & 3; No 2 or 4
- 88type: Has 1-2-3; No 4
- 89type: Has 1-2-4; No 3

Location of the Casting Codes

86-90 Parts ID (Condensed Version)

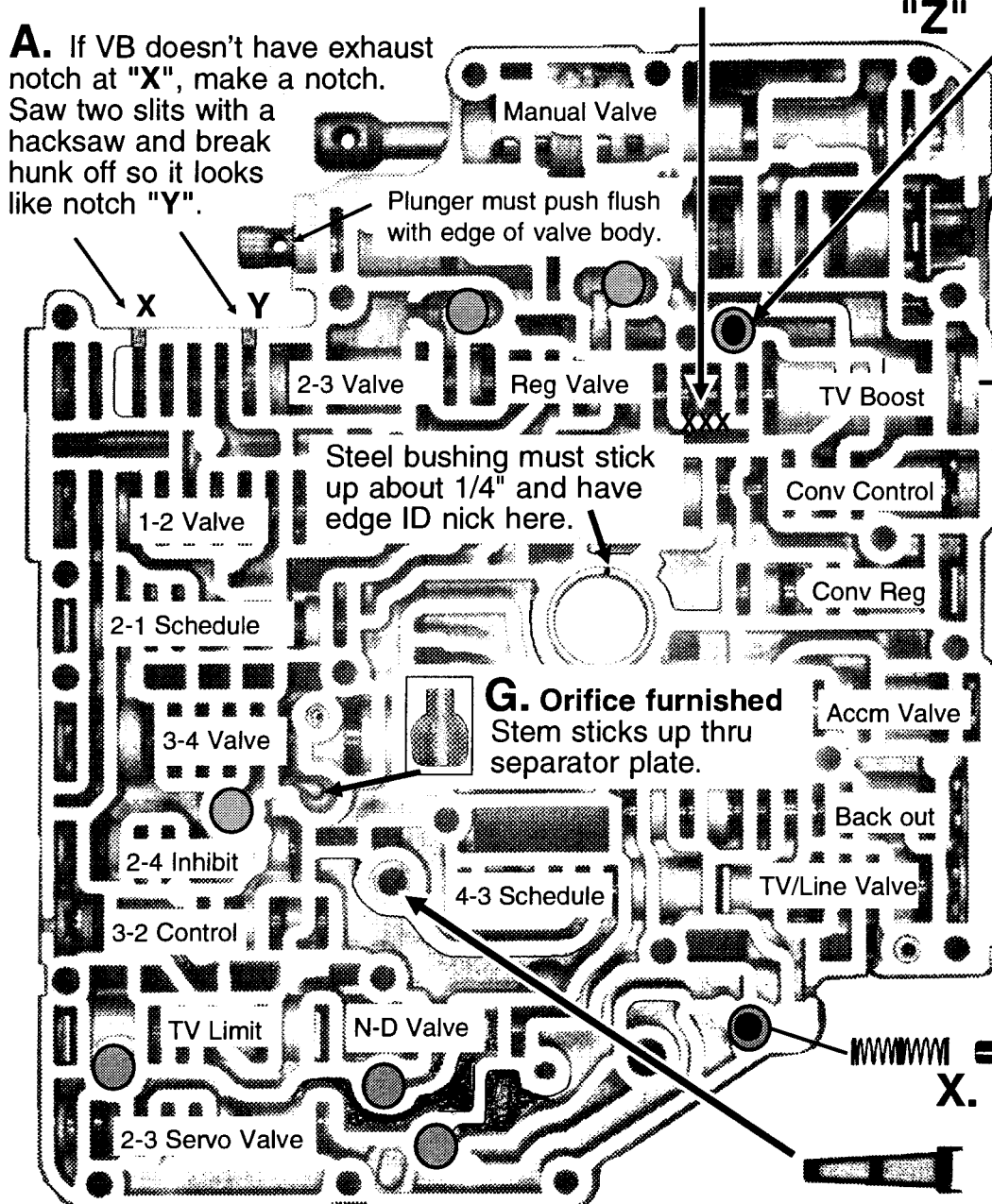
20% come in for repair with mismatched parts even when the customer says, "No one has worked on it". Save yourself a big pain, you know where, by identifying and matching the parts during assembly. With upgrades furnished, all 86 to 90's function the same. You can use any year, matching parts, in any 86-90 trans, or swap the transmissions. The only difference may be a slight change in max throttle up-shift/kickdown speeds. *Air check electrical pressure switches and re-install in same location as the car came with.*



Open the bag that contains the checkballs.

B. Drill thru partition three times at "X"s with .055 drill.

A. If VB doesn't have exhaust notch at "X", make a notch. Saw two slits with a hacksaw and break hunk off so it looks like notch "Y".



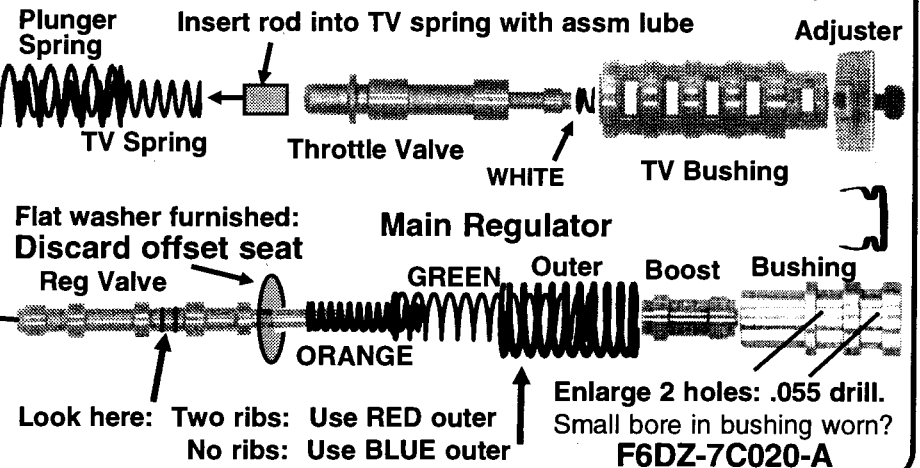
"Z" Align gasket and plate at "Z" holes



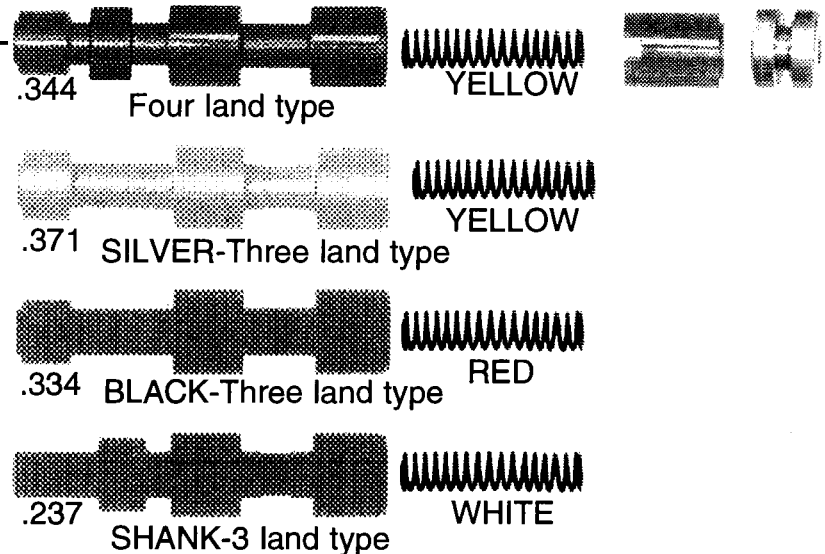
X. Discard original drainback valves and springs. Install two new pointed valves and springs at "X".

To remove retainers

C. TV/PR section: Reduces sticking TV and accidental TV disassembly. Upgrades line pressure to later model specs.



D. Accumulator Valve: Match valve with picture.



E. ● SIX 5/16" plastic balls

Naxod/vb

Open bag that contains the big WHITE spring.

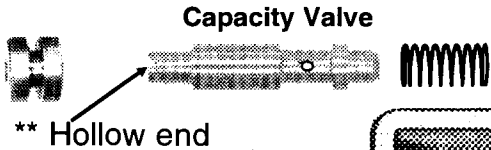
Pump Body & 1-2 Capacity

5/16" Plastic balls

C. 86-89 has nine.
90type 3.8 has ten.

B. In circle shown: Use ice pick or center punch to make a dink about 1/8" below top of partition "X" on the angle shown by arrow. At same angle use small drill furnished (.055) to drill a hole through partition "X". Install .038 cotter pin furnished through the hole and spread the ends.

A. 1-2 Capacity Valve:
Install WHITE spring for normal shift.
Install BLUE for slightly shorter shift.



Retainer

To remove retainer

B.

WARNING: Do not use grease to hold checkballs; or for assembly. Use approved assembly jelly.

Grease can cause 1-2 tieup, 2-3 bind-up, 2-3 cutloose, bind or no reverse, and total trans burnup.

This upgrade and changes in the 2nd accumulator system corrects:
No max 1-2 hot--Hot slide or slide bump
Rough 1-2 cold--Rough 1-2 at 3/8 throt-

90type-3.8

D. Original Silver

NO CHECKBALL HERE

NO CHECKBALL HERE

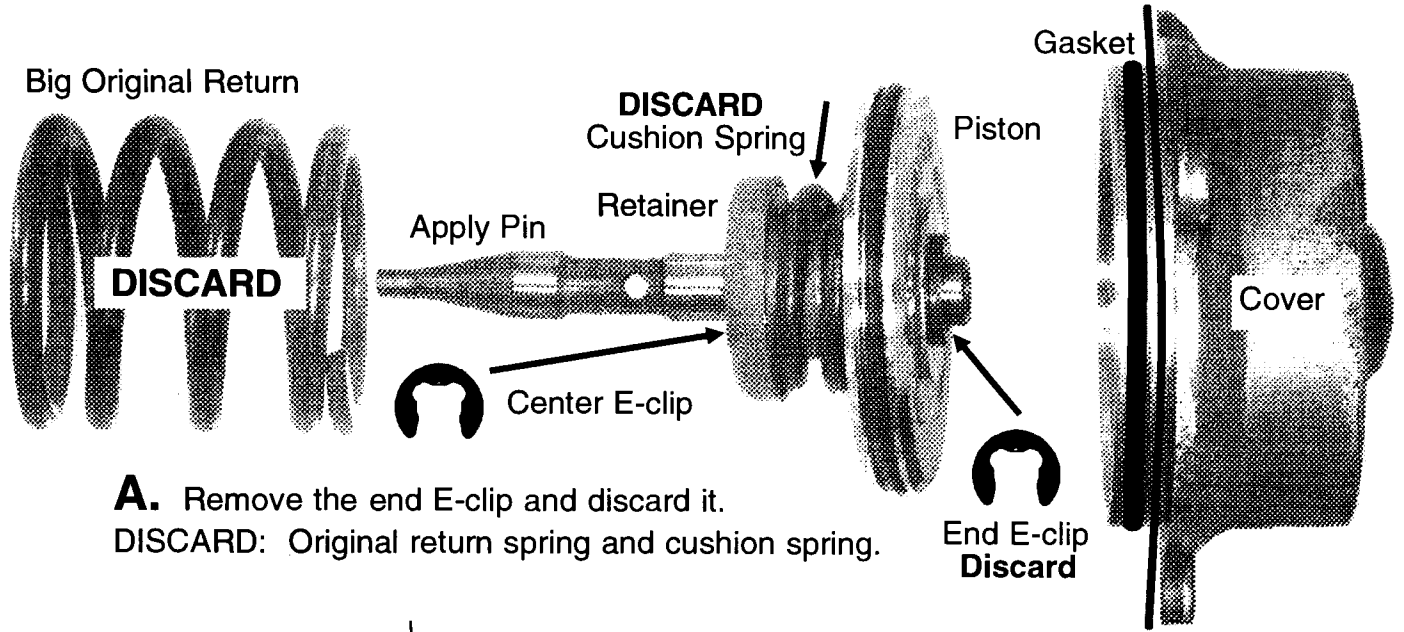
B3 -ball

"Z" Line up plate and gasket at "Z" holes.

Listen up: The single biggest cause of rework is loose VB bolts. One tightening won't get the job done.

Tighten VB bolts 3 times: First time 6 ft lbs--Then to 8 ft lbs--then 10

Smart Act® 1-2 Servo



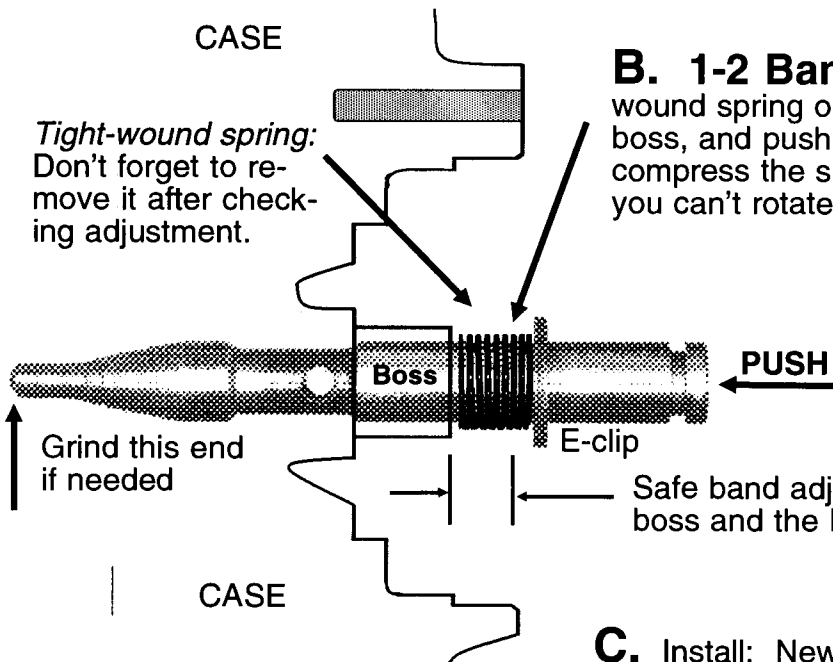
A. Remove the end E-clip and discard it.
DISCARD: Original return spring and cushion spring.

B. 1-2 Band Adjust: Place the tight wound spring on the pin between E-clip and the pin boss, and push firmly on the pin. The E-clip must compress the spring slightly but not so much that you can't rotate the spring with your fingers.

If pushing on pin does not compress the spring a little, grind small end of the pin @ 1/32" and try it again.

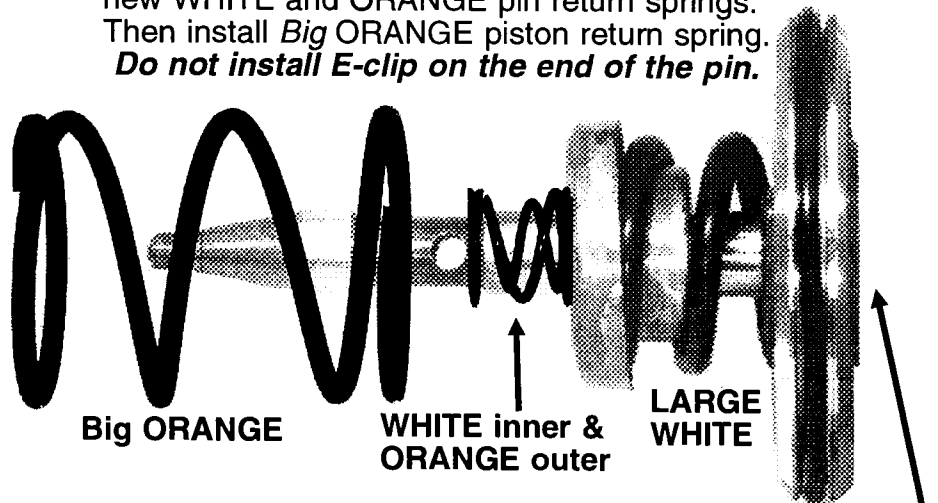
If pushing on pin makes the spring so tight you can't finger-turn it, install a longer pin or weld on small end.

Safe band adjustment is .480 to .530 between end of boss and the E-clip, while pushing firmly onto the pin.



What you are fixing:
 These changes function with the new 3rd feed circuit to reduce hot 2-3 cutloose. The pin bushing and cushion spring act with the valve body changes to eliminate the "gumpy" 3-2 kickdown at higher speeds and 3-2 and 3-1 kickdown cutloose bang at low speeds and produces a smooth 3-2 coast downshift. This also allows the use of higher flow 3rd circuit to prevent 3rd clutch burnup and the loss of 4th

C. Install: New WHITE cushion spring and new WHITE and ORANGE pin return springs. Then install *Big* ORANGE piston return spring. **Do not install E-clip on the end of the pin.**



Adjust/Fix Throttle/TV Cable Relationship

This is the part you'd like to skip -- but better not. Many shops have ended up paying for another trans job when TV comes unglued and strands customer on the way to see Gramps.

Listen up: TV malfunction is a main cause of planet gear burnup and the most common cause of complaint/failure.

[This kit reduces planet burnup and shift complaints.]

Product Support:
(626) 443-7451

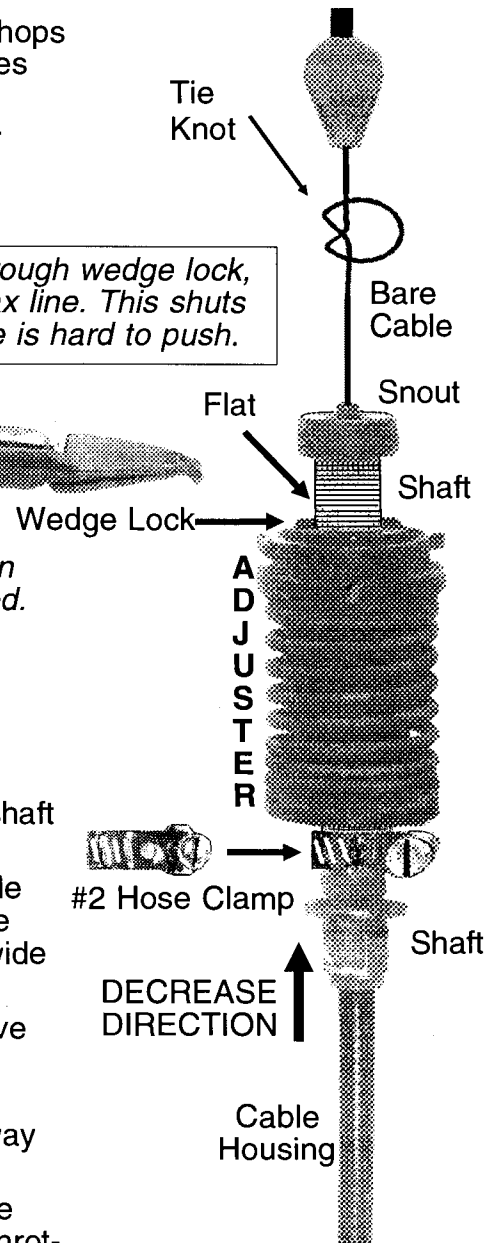


When shaft slips through wedge lock, Fail-safe causes max line. This shuts off lube & the throttle is hard to push.

If you're happy with how TV is working, install #2 hose clamp on the cable housing up tight against the adjuster. You are finished.

If throttle is hard to push and trans has no upshifts, or has late hardshifts, the TV system has probably defaulted to "Fail-safe". The following will get it working again and keep it working right:

1. Disconnect the TV and tie a single knot in the cable. Insert snap ring pliers along side the flat on the shaft and open the wedge lock. With the other hand push the cable housing and shaft towards the bare cable 1/2" or more. (Decrease direction.)
2. Have someone floor the gas pedal from inside the car. While they are flooring the pedal, you bend or adjust the injector cable or bracket until injector throttle arm bottoms solidly against its wide open stop.
3. Install #2 hose clamp on the shaft as shown. It's OK to move the shaft to get room for the clamp. Tighten it on the shaft and then loosen it slightly so it will slide back and forth.
4. Insert snap ring pliers: Open wedge lock and slide shaft away from the bare cable as far as it will go.
5. While you push the snout away from the bare cable with one hand, have someone floor throttle from inside the car. As the throttle is pushed the shaft will ratchet through the wedge lock towards the bare cable. The reason you are pushing against it is so that it won't over-jump through the notches.
6. Max points are now all adjusted. Make pocket knife mark on the shaft up against wedge lock. It's the max TV mark.
7. Slide the clamp against the adjuster and tighten it.
8. **Road test. Remember:** The clamp is holding TV adjusted to absolute max, which may be too much. On the road test, take snap ring pliers and a screwdriver to reduce/adjust TV.
9. **To reduce TV:** Loosen clamp and slide it away from adjuster about 3/32". Insert snap ring pliers to open wedge lock and slide shaft towards bare cable. Still too much TV? Do it again.
10. **Gauge Method is Fastest:** With a gauge on the TV port. With gage installed set TV to 3 to 9 lbs at idle.



Additional Repair Info 3/98

Forward Clutch Piston

ALWAYS replace it with a new steel type piston
.F4DZ-7A262-A Piston



Intermediate Clutch

86 to 88: To avoid shopping mall 1-2 rough shift install a cushion spring against the piston.

E8DZ-7E085-A Plate, Cushion

This clutch likes .010 to .030 clearance.

Why synthetic fluid is recommended?

Various types/brands of trans fluid will boil, ignite and lose lubricity at different temperatures. On average the fluid will boil or vaporize in the suction passage [between the filter and the pump] at about 300 F.

When the fluid boils or vaporizes there is only vapor going through the cooler and to lube. When that happens the planet is going to go up in smoke.

Synthetic oil boils at about 400 degrees. 8 qts of synthetic oil will raise the boiling temperature about 50F, and the ignition temperature about 100F. This gives your job more lubrication safety.

Lead foots, police, taxis and towing, fill completely with synthetic fluid/oil.

If synthetic ATF is not available you can use **synthetic engine oil**, it works fine. We have used Mobil #1 engine oil with great success.

When the fluid boils or ignites, it will not cool the gears, bushings or bearings. 5 year old radiator won't won't keep this trans cool on long upgrade on a hot day.

"Thanks for listening."

Protect your work: Low engine coolant level, scaled and oxidized or plugged radiator or auxiliary cooler, and leaks, can burn-up trans BEFORE any engine problem is noticed.

At 100,000 miles these cars need a NEW radiator. With a new radiator trans will run up to 70 degrees cooler on hot trip.

Check Cooling System

Recovery tank: Flip up lid on tank.

Is it full or empty? _____

Is it just water or is it Antifreeze? _____

Radiator: When cold, remove cap.

If the rubber in the cap is swollen oversize, or soft, install a new cap.

Look in the gooseneck and tank for scale and scum.

Coolant level should be even with the tubes just under the cap. Is it? _____

Is it just water or is it coolant? _____

If it is low, how low is it? Insert long screw driver and see how low it is: _____

Four inches down the tubes means 25% of cooling is missing. Eight inches means half the cooling is missing.

Leaks: Where did missing coolant go?

Look around the side tanks (front and back) and around the water pump and hoses for signs of leak.

If the vehicle needs a cooling system service, write it on the job ticket, and recommend local reliable professional radiator shop. For example:

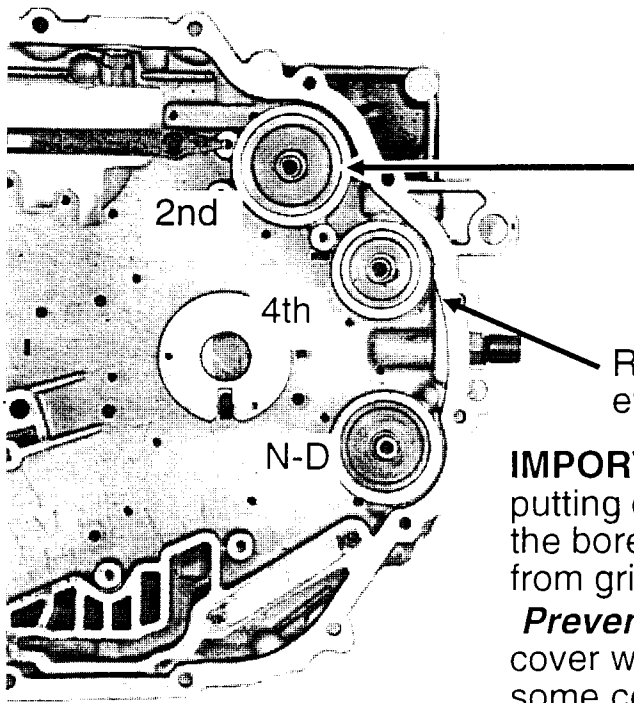
CAUTION: Needs immediate cooling system service to prevent trans damage.

We use: Tri-J Radiator

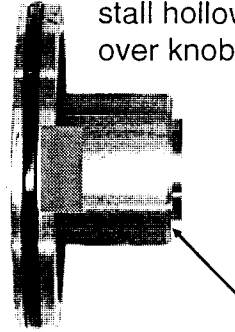
At 100,000 miles these cars need a NEW radiator. With a new radiator trans will run up to 70 degrees cooler on hot triip.

Use this instruction for the top of page 5

2nd Accumulator



With a glob of assm Jel install hollow end of Spacer over knob on the piston



M
BLUE

Reinstall 4th accumulator pistons and springs even though its function is not required,

IMPORTANT: It's best to wash this by hand. Before putting cover into parts cleaner start the pistons into the bores with the seal on them to protect the bores from grit and metal particle damage.

Prevent gasket blowout. Glue gasket to the chain cover with a hardening type, rubber cement. Also put some cement on the case. Ford D7AZ-19B508-B is perfect. Tighten bolts easy and slowly several times.

N\axod\2ndac Oct 2000

AX-BST AXOD--AXODE--AX4S--AX4N



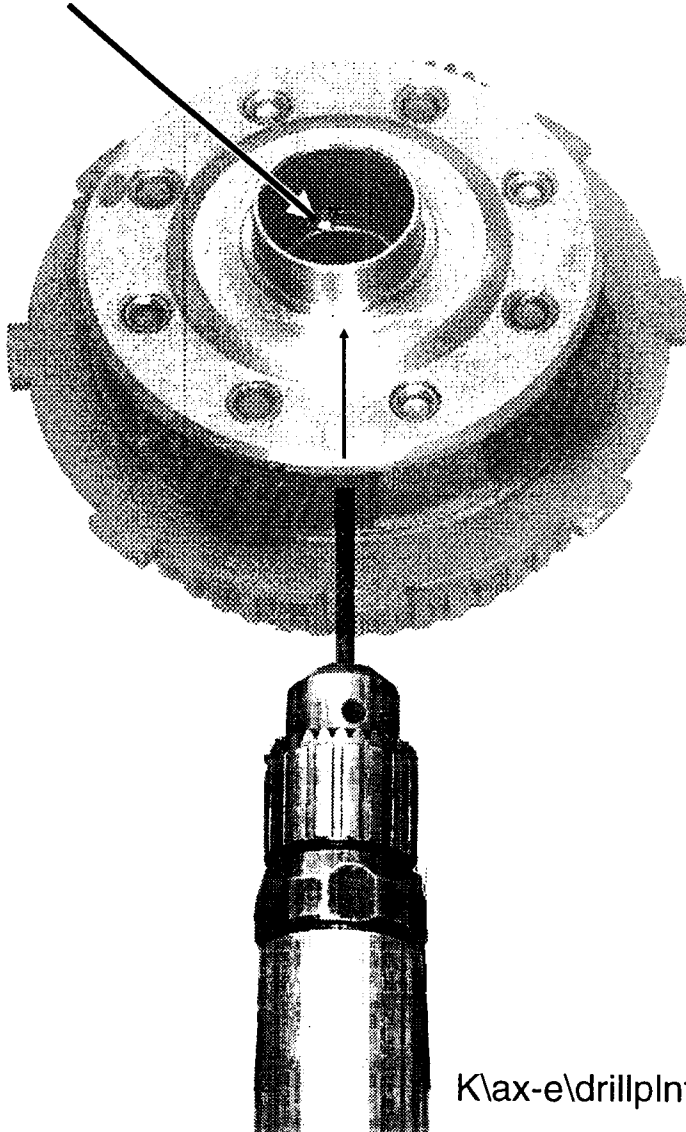
SPRING: Use only in AXOD.
Do not install the spring in AXODE, AX4S or AX4N.

AX-BSH-BST>AX-VL-BST © TransGo 1999

AXOD & AXODE: Front Planet

Enlarge the two holes just above
the bushing or needle bearing
with the .110 drill furnished.

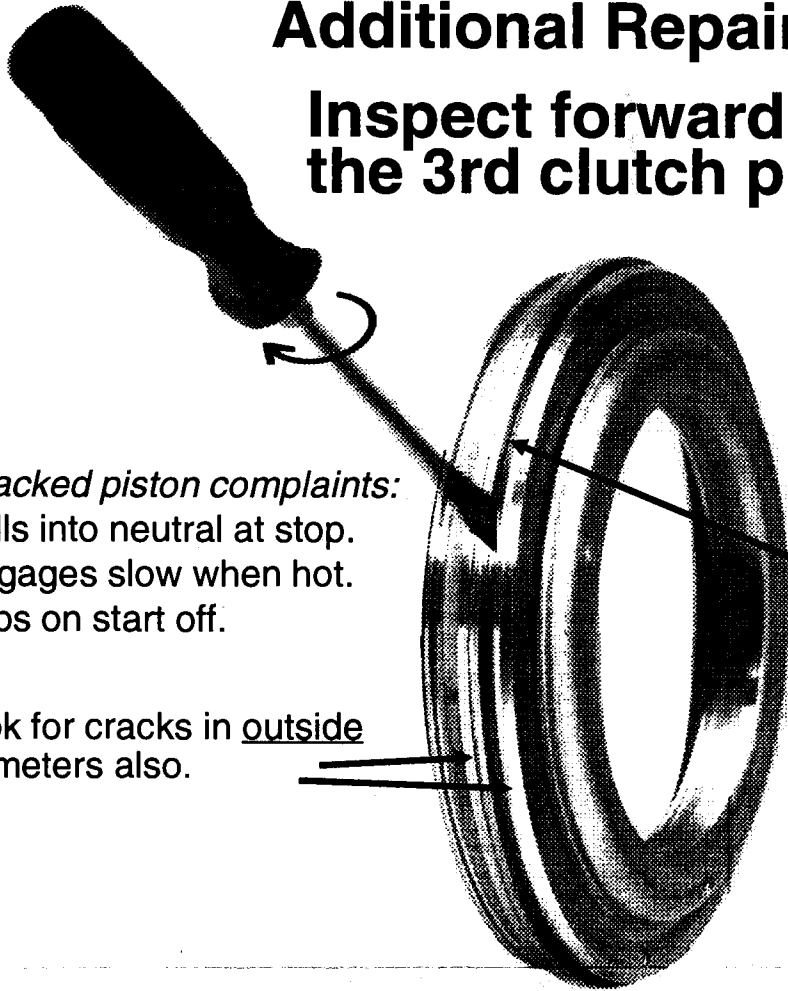
Insert drill from the side under
the cover, past the planet gears.



Klax-e\drillpnt

Additional Repair Info 8/93

Inspect forward clutch piston and the 3rd clutch piston for cracks:



Cracked piston complaints:
Falls into neutral at stop.
Engages slow when hot.
Slips on start off.

Look for cracks in outside diameters also.

Remove seal:
Insert screwdriver into groove at various places, and twist it gently while looking at the bottom corners of groove for cracks.


An air check may not reveal a crack under the seal.

Look for cracks.

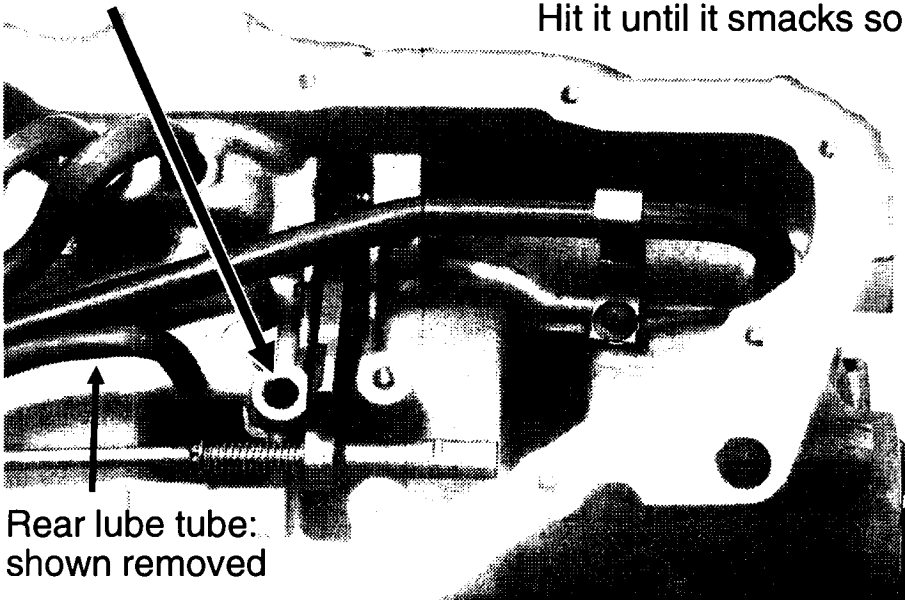
If the forward piston is aluminum ALWAYS replace it with new steel type piston

New Piston: #F4DZ-7A262-A

DUMPING LUBE TO THE PAN? Improper installation of rear lube tube seal [#212] can **cause loss of rear and front lube pressure.** [They are connected with oil grooves in the front planet bushing.]

 Rear lube seal
E6DZ 7G085-A

Listen up: Install this seal with a 5/16 punch or bolt **inside the steel shell.** Hit it until it smacks solid against support.



Rear lube tube:
shown removed

Don't be afraid to smack this seal. The shell is necked down to act as a solid stop. Hit it!



OVER

Biggest cause of rework and come-backs is leaking or blown gaskets:

COMPLAINTS: Slips on start off-- Bindup or draggy reverse--Hard throttle makes fast early shifts--Bindy or draggy feeling in 2nd, 3rd or 4th--Erratic hard or soft upshifts or downshifts.

CAUSE: Bolts not tight enough. Valve body and chain cover crossleaks.

CORRECTION: Glue the chain cover gasket with a hardening-type cement.

Ford gasket & trim cement is recommended-- #D7AZ-19B508-B

Valve body bolts: Some bolts compress 5 gaskets. One tightening won't do it. Use a long extension to keep tool aligned in the bolt head.

Tighten bolts three times:

1st time 8-10 ft lbs

2nd time 10-12 ft lbs

3rd time 10-12 ft lbs

Why synthetic fluid is recommended?

Various types/brands of trans fluid will boil, ignite and lose lubricity at different temperatures. *A 3-5 year old radiator and cooler won't cool like new.* When the fluid boils or ignites, it will not cool the gears, bushings or bearings.

8qts of synthetic oil will raise the boiling temperature about 40F, and the ignition temperature about 100F. This gives the job more lubrication safety, even when the cooling system isn't perfect.

If synthetic ATF is hard to find, use 8qts of any weight synthetic engine oil.

Lead foots, HD (Includes light towing):

Fill completely with synthetic fluid/oil.

Protect your work: Low engine coolant level, restricted radiator tubes, scaling and oxidation of radiator or auxiliary cooler tubes, and leaks, can burn-up trans BEFORE any engine problem is noticed.

Check Cooling System

Recovery tank: Flip up lid on tank.

Is it full or empty? _____

Is it just water or is it Antifreeze? _____

Radiator: When cold, remove cap.

If the rubber in the cap is swollen oversize, or soft, install a new cap.

Look in the gooseneck and tank for scale and scum.

Coolant level should be even with the tubes just under the cap. Is it? _____

Is it just water or is it coolant? _____

If it is low, how low is it? Insert long screw driver and see how low it is: _____

Four inches down the tubes means 25% of cooling is missing. Eight inches means half the cooling is missing.

Leaks: Where did missing coolant go?

Look around the side tanks (front and back) and around the water pump and hoses for signs of leak.

If the vehicle needs a cooling system service, write it on the job ticket, and recommend local reliable professional radiator shop. For example:

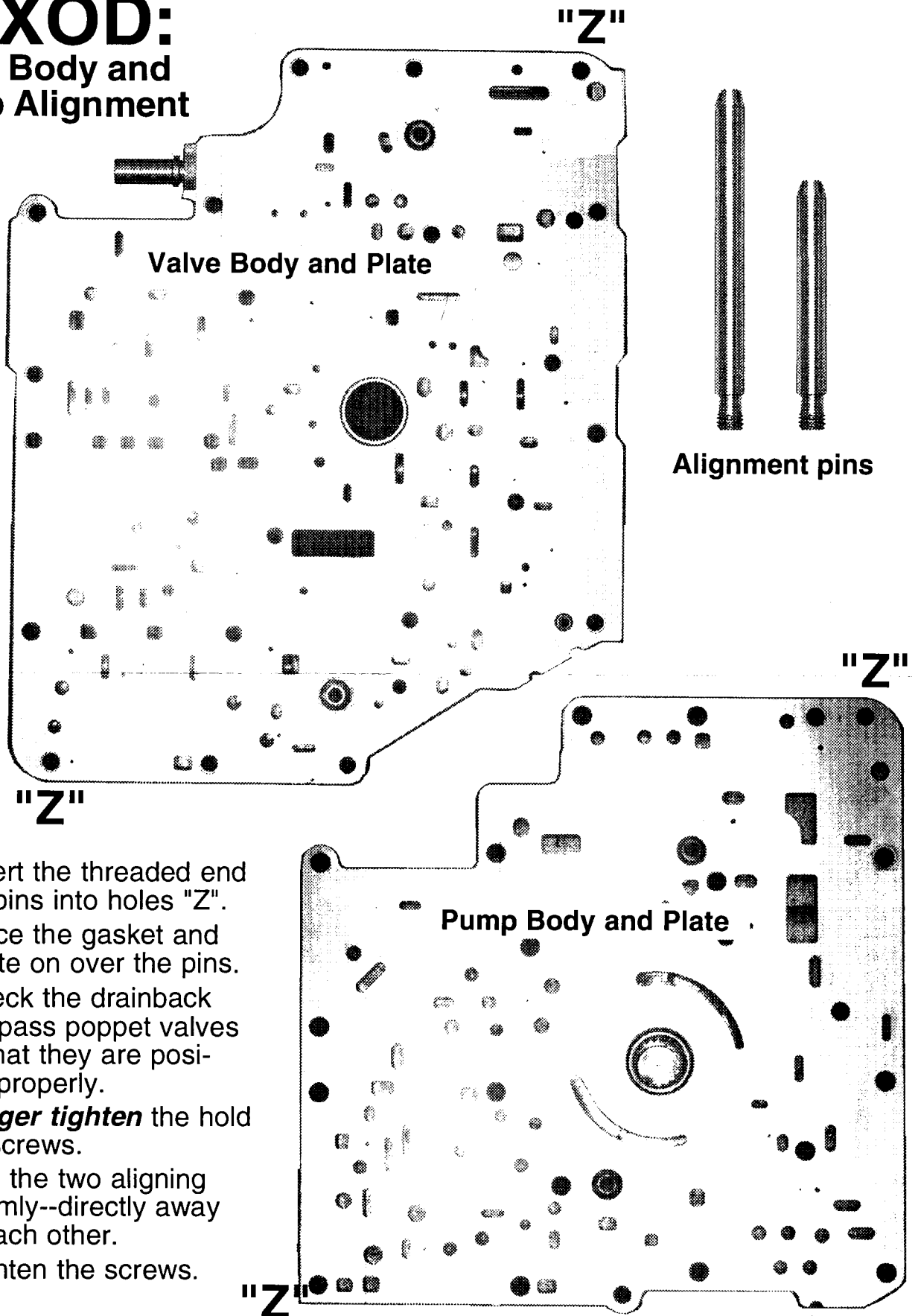
CAUTION: Needs immediate cooling system service to prevent trans damage.

We use: Tri-J Radiator--Phone 465-7784

© TransCo 1992

If you have a question or the trans is giving you trouble, call our tech dept.
(626) 443 7451 Thanks for listening

AXOD: Valve Body and Pump Alignment



1. Insert the threaded end of the pins into holes "Z".
2. Place the gasket and the plate on over the pins.
3. Check the drainback and bypass poppet valves to see that they are positioned properly.
3. **Finger tighten** the hold down screws.
4. Pull the two aligning pins firmly--directly away from each other.
5. Tighten the screws.

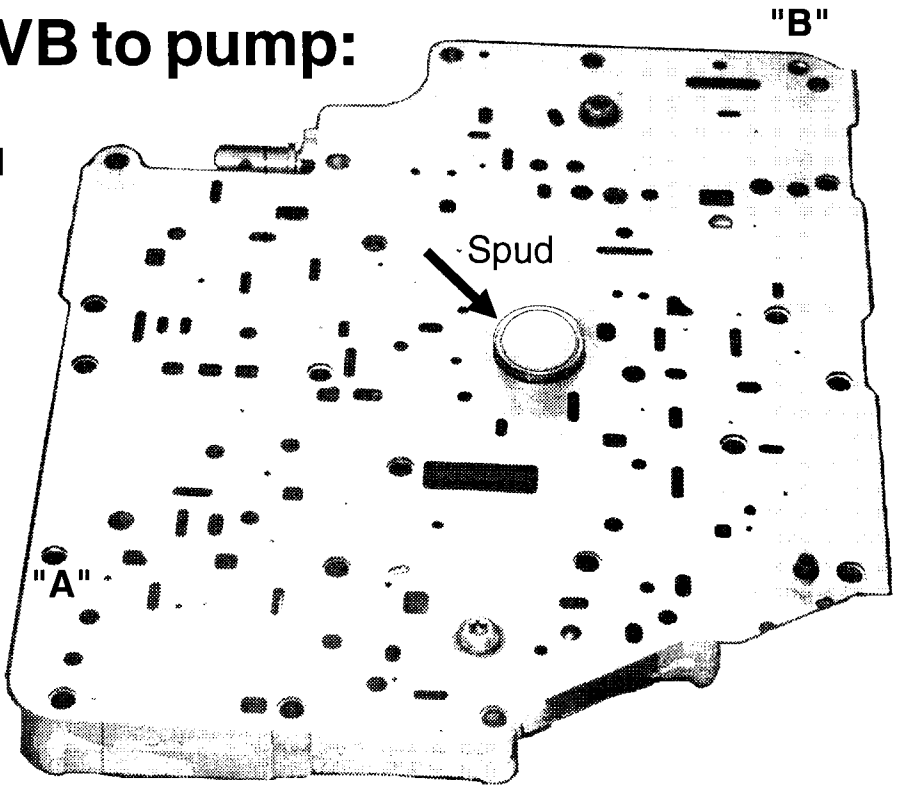
OVER

Align VB to pump:



Aligning Spud

1. Insert spud through the VB and into the pump bearing. When it's in all the way in there is still about 1" sticking up.
2. Insert tapered end of lineup pin thru hole "A" and the other pin thru "B". If pins won't go thru easily the plates are out of line.
4. Tighten the two bolts on the pump side.



Installing Valve Body:

1. Screw lineup pins into holes "A" and "B" with very firm hand grip or gently with pliers.
2. Install gasket and valve body.
3. Install and tighten a few bolts.
4. Remove pins with pliers.

