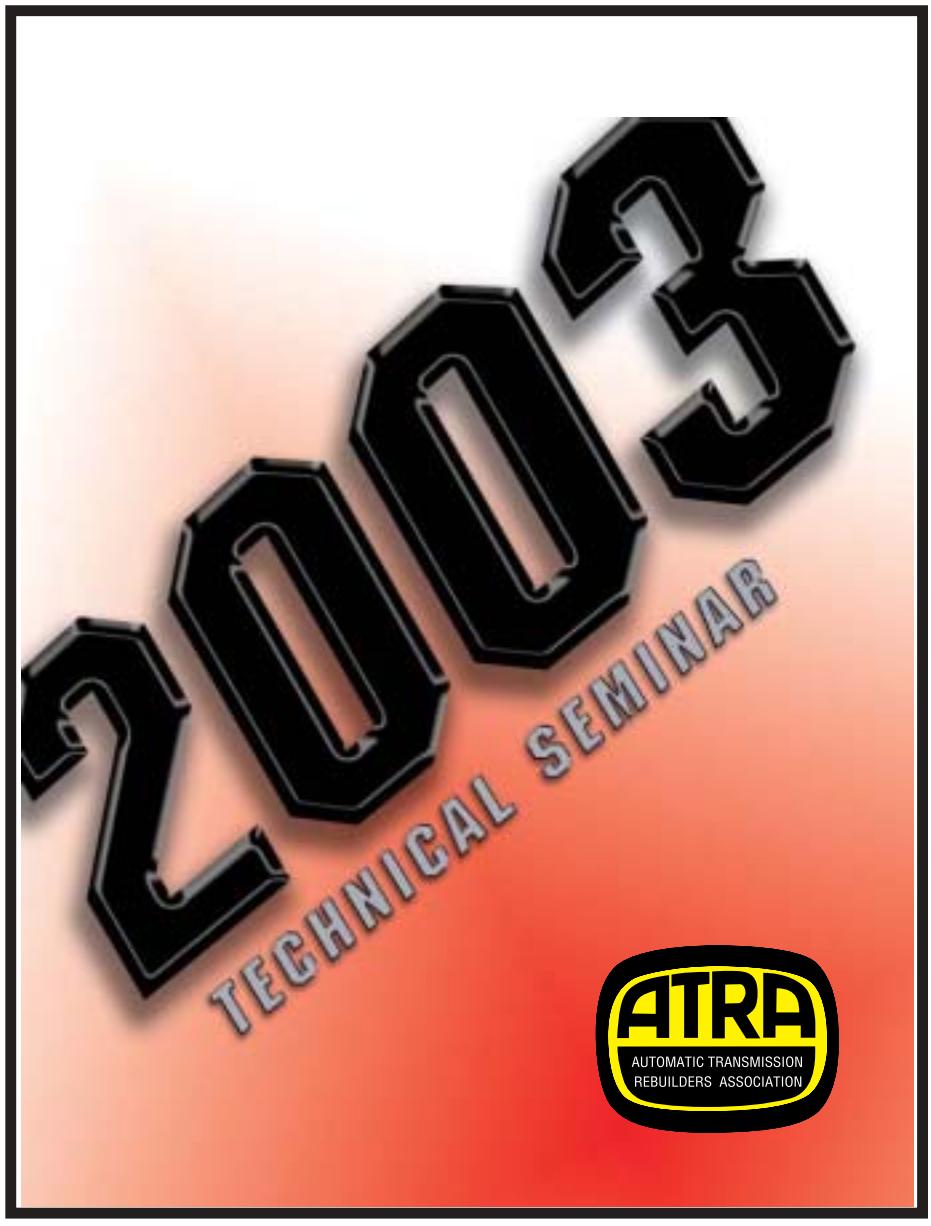
2003
TECHNICAL SEMINAR
ATRA
AUTOMATIC TRANSMISSION
REBUILDERS ASSOCIATION

Automatic Transmission Rebuilders Association

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Program Contents

ATRA Technical Team

Dennis Madden
Chief Executive Officer

Lance Wiggins
Technical Director

Creating a Great Seminar...

For most of you, a technical seminar is maybe half-a-dozen or so hours of intense technical information... and then, as quickly as it begins, it's over. But a lot of effort goes in ahead of time, researching, developing and designing a seminar, long before it's ready to play your town. Long days... late hours... frayed nerves... all part of the process to put a clean, carefully-choreographed presentation in front of a discriminating audience.

The folks involved in developing this year's seminar are the leaders in the transmission repair industry. With over 200 years of combined technical experience, they've poured their heart and soul into every page and slide in this program. Whether their contribution involved technical expertise or organizational skills, the culmination of their efforts was an extraordinary educational experience that we're proud to call the ATRA 2003 Technical Seminar.

We hope your experience is as rewarding as it was for us to develop it.

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Technical Supervisor

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Senior Technical Advisor and
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Technical Advisor,
Seminar Speaker, Service Engineer

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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

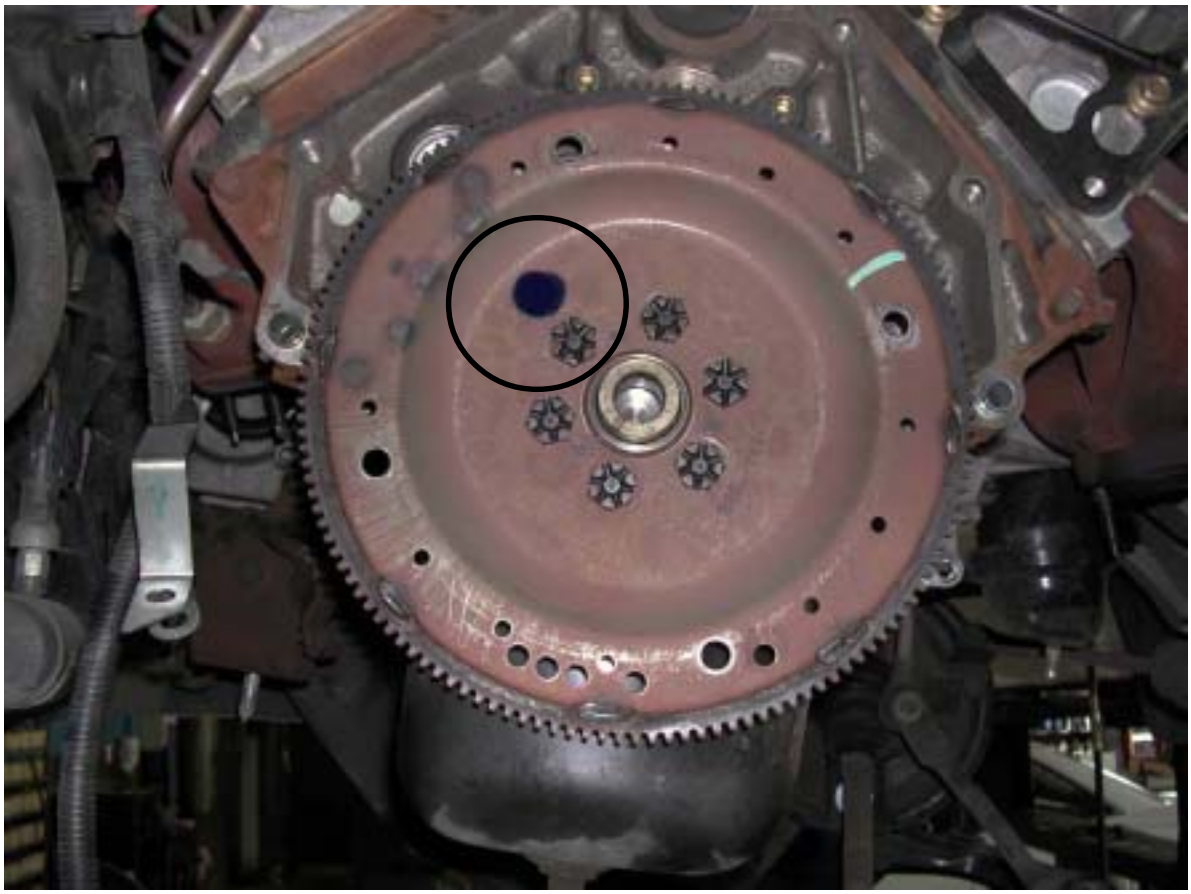
FORD Contents

AX4S

Vibration After Overhaul

(3.8L Only) Possible Broken Flexplate

A Vibration or broken Flexplate on models between 1995-2001 that are equipped with 3.8L engines may be caused by the misalignment of the converter to flexplate. The Flexplate has an alignment paint dot on the flexplate and torque converter from the factory. This dot is there to ensure proper alignment.



AX4S/AX4N

New Pump Bearings

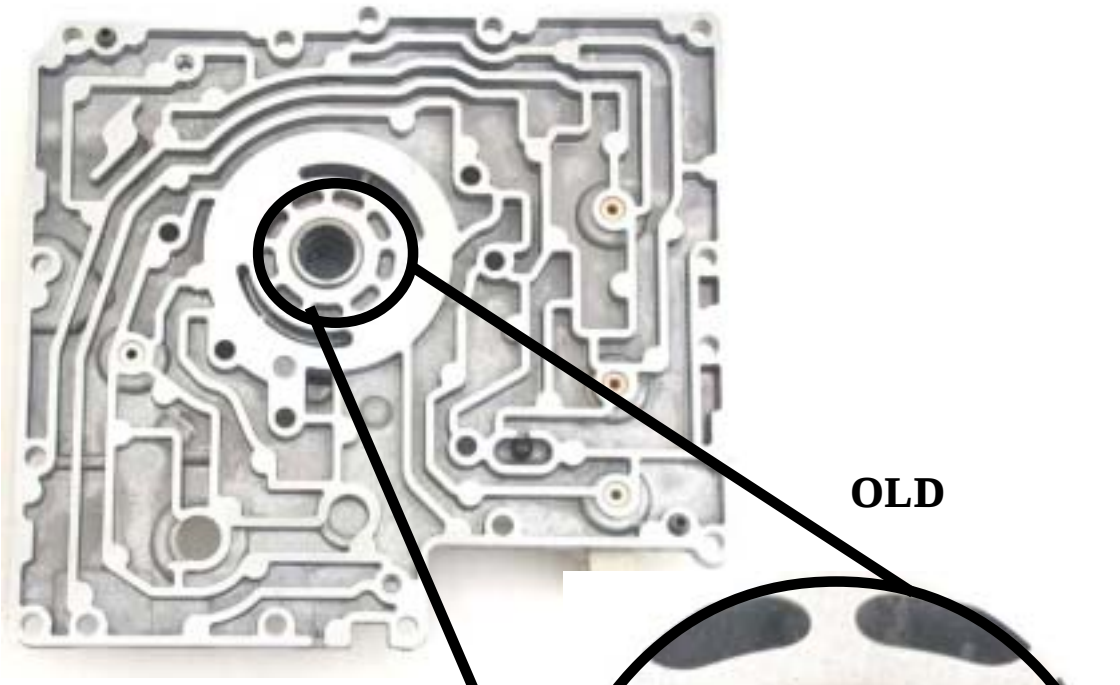
When replacing the pump bearing on a AX4S or AX4N use the new updated bearing assembly which has a built in seal. The seal is used to enhance lubrication to the bearing for longer life expectancy.

AX4N
Part# XF1Z-7G184-AA

AX4S
Part# XF2Z-7G184-AA

AX4S/AX4N

New Pump Bearings



OLD

NEW

SEAL

Install the seal away from the pump rotor

AX4N

Harsh 1-2 Shift

There are a number of problems related to this symtom including:

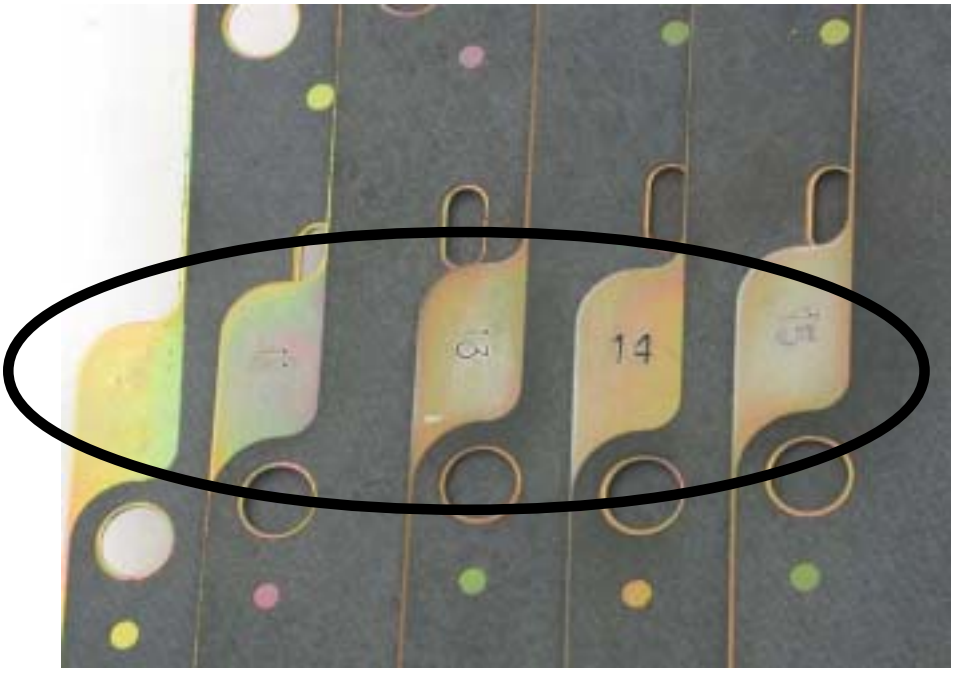
- Â ***Wrong Gaskets***
- Â ***Wrong Seperator Plate***
- Â ***Damaged Accumulator Piston***
- Â ***Wrong Accumulator Spring***
- Â ***Valve Body Wear***

AX4N

Harsh 1-2 Shift

Seperator Plate and Gasket

Lincoln 1995-97	(stamped 11)	part #F50Z-7Z490-A
Lincoln 1998	(stamped 84)	part #F80Z-7Z490-AA
Lincoln 1999-00	(stamped 90)	part #FX3Z-7Z490-AA
Taurus/Sable 1994-95 w/3.0L	(no stamp)	part #F5DZ-7Z490-A
Taurus/Sable 1996-97 w/3.0L 2V	(stamped 13)	part #F6DZ-7Z490-B
Taurus/Sable 1998-99 w/3.0L 2V	(stamped 87)	part #F8DZ-7Z490-BA
Taurus/Sable 1996-97 w/3.0L 2V	(stamped 14)	part #F6DZ-7Z490-A
Taurus/Sable 1998-99 w/3.0L 4V	(stamped 86)	part #F8DZ-7Z490-AA
Taurus SHO 1996-97 w/3.4L	(stamped 15)	part #F6DZ-7Z490-D
Taurus SHO 1998-99 w/3.4L	(stamped 85)	part #F8DZ-7Z490-CA
Taurus/Sable 2000	(stamped 03)	part #YF1Z-7Z490-CA
Taurus/Sable 2001-03	(stamped 05)	part #1F1Z-7Z490-AA



AX4N

Harsh 1-2 Shift

Damaged Accumulator Piston

A Damaged Accumulator Piston assembly can cause a number of shifting problems from late, early, harsh, soft and more. When reassembling this unit pay close attention to the housing and piston areas. If the piston is worn or the housing scored the chances of the piston cocking in the bore are increased.

Check the Piston housing for wear, grooves, or scoring

Check the Piston and Rod assembly for wear

AX4N

Harsh 1-2 Shift

Wrong Accumulator Spring

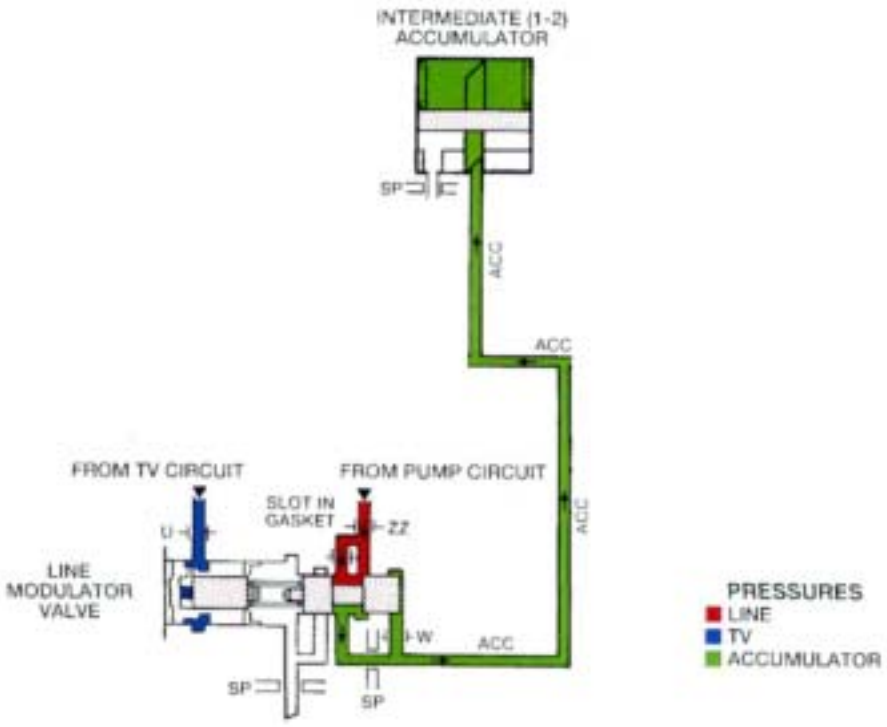
VEHICLE	1-2 ACCUMULATOR	COLOR
95-02	F5DZ-7G267-A	ORANGE
95-96 SHO ONLY	F6DZ-7G267-A	PURPLE
97-01 SHO ONLY	F7DZ-7D397-AA	PLAIN

AX4N

Harsh 1-2 Shift

Accumulator Hydraulic Circuits

Fluid under pressure in the pump circuit moves to the line modulator valve, where it enters the accumulator circuit. The accumulator circuit provides variable hydraulic backpressure to the accumulators for five apply components. The variable pressure of fluid in the TV circuit is controlled by the pcm and changes the position of the line modulator valve. When TV pressure is lower, accumulator circuit pressure is lower. The results in softer shift feel provided by the accumulators during shifts when engine input torque is lower. When TV pressure is higher, accumulator circuit pressure is higher. This results in firmer shift feel provided by the accumulators during shifts when engine torque is higher. Damage to the Line Modulator Valve can result in no moulation of the valve and allowing direct line oil to influence the Accumulator.



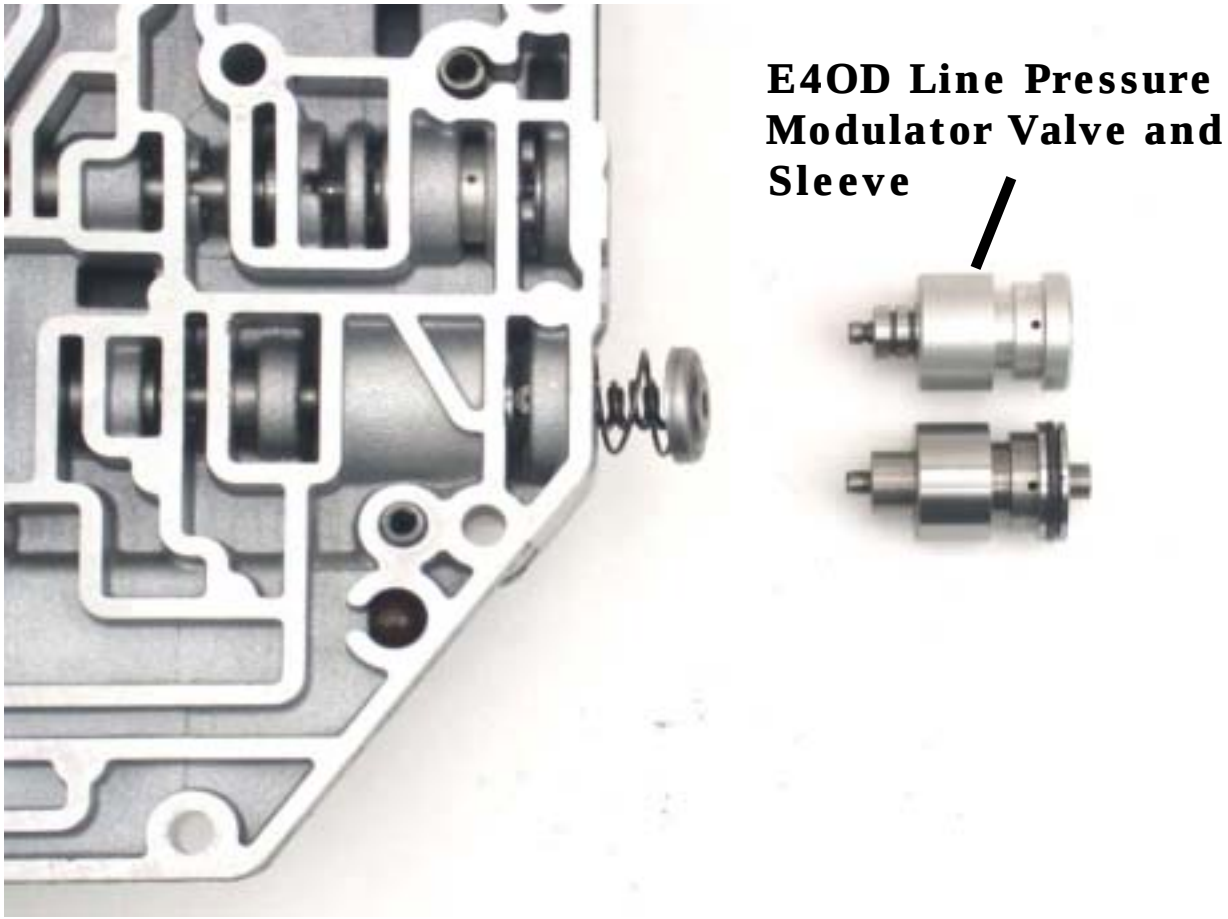
AX4N

Harsh 1-2 Shift

Valve Body Wear

Check for wear at the Line Pressure Modulator valve and sleeve assembly. If the sleeve is damaged you can replace it with an E4OD Line Pressure Modulator Valve and Sleeve assembly. The E4OD Line Pressure Modulator valve is smaller in size and allows less oil to the back side of the Accumulator apply side during operation resulting in a softer shift.

Damage to the Line Modulator Valve may result in a Slide Bump, Harsh Shift, or dragging shifts.



AX4N

Harsh 1-2 Shift

Incorrect Clutch Pack Clearance

1995-96

Forward Clutch (.040-.059) wave spring
Direct Clutch (.050-.069)
Intermediate (.050-.069) wave spring
Reverse (.038-.064) wave spring
Low-intermediate clutch (.050-.075) wave spring

1997-98

Forward Clutch (.050-.059) wave spring
Intermediate Clutch (.050-.069) no wave spring SHO
Direct Clutch (.050-.069)
Reverse 97 all (.038-.064) wave spring
Reverse 98 SHO (.049-.072) wave spring
Reverse 98 except SHO (.040-.063) wave spring
Low-intermediate clutch (.050-.075) wave spring

1999

Forward Clutch (.050-.069) wave spring
Intermediate (.050-.069) no wave spring SHO
Direct Clutch (.050-.069)
Reverse Clutch SHO (.050-.072) wave spring
Reverse Clutch except SHO (.040-.063) wave spring
Low-intermediate Clutch (.050-.075) wave spring

2000-03

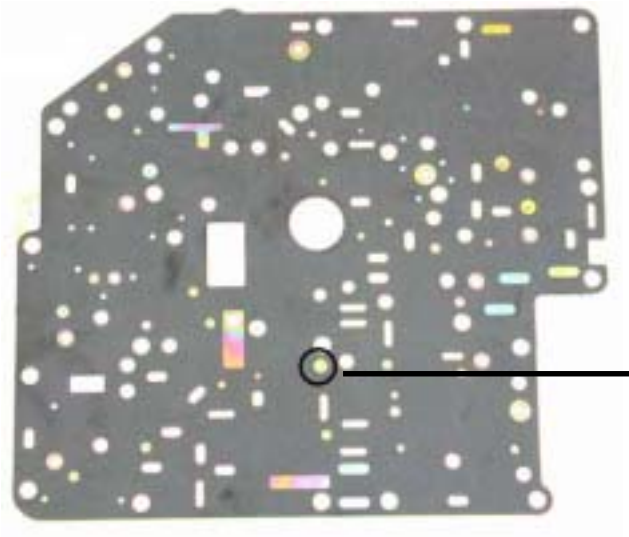
Forward Clutch (.040-.059) wave spring
Intermediate Clutch (.050-.069) wave spring
Direct Clutch (.050-.069)
Reverse Clutch (.050-.072) wave spring
Low-intermediate clutch (.050-.075) wave spring

AX4N

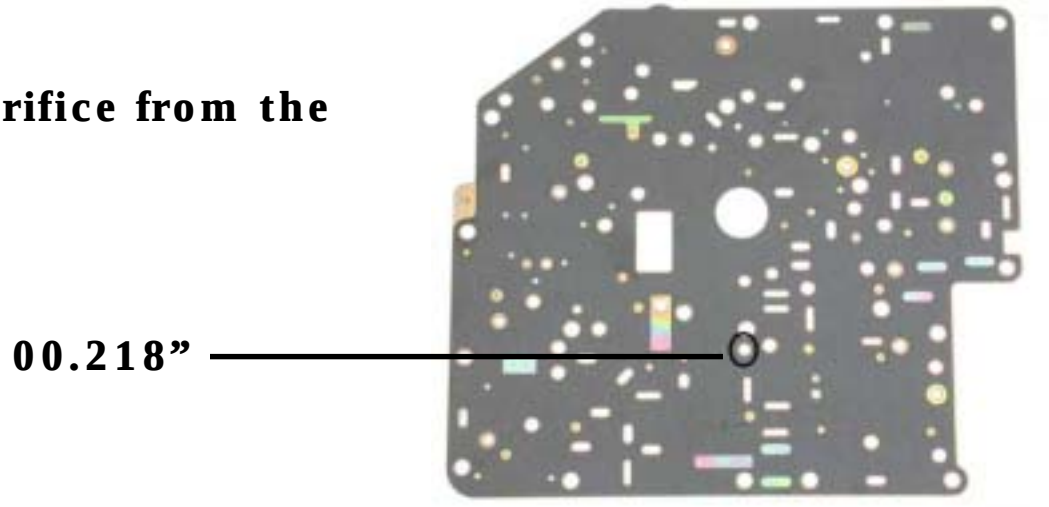
Harsh 4-3 Downshift

Wrong Seperator Plate

Many times the wrong seperator plate may be changed inenvertantly. Pay close attention to the O/D Servo exhaust orifice size, these sizes are not all the same.



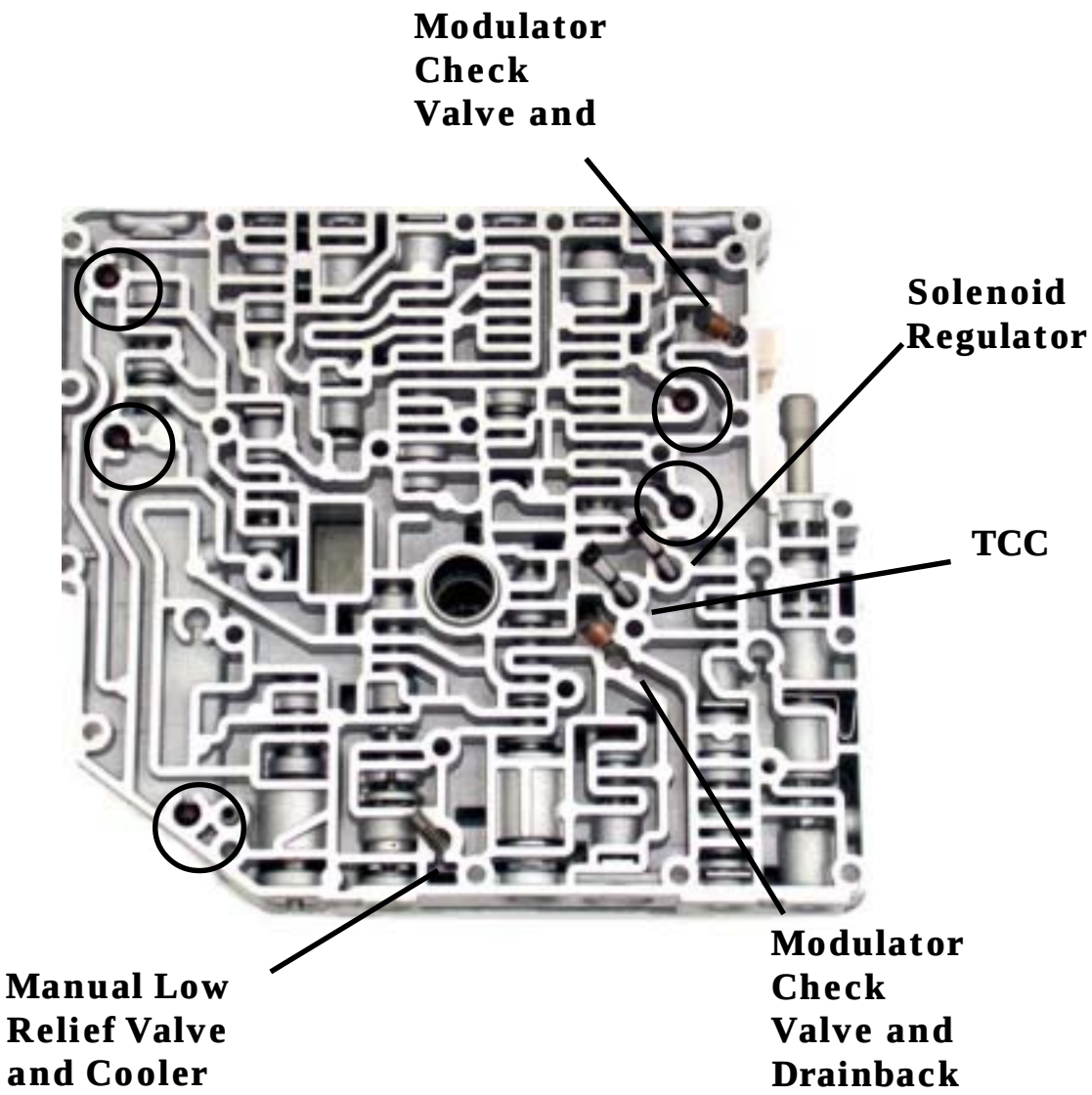
Exahuast orifice from the O/D Servo



AX4N

Check Ball and Relief valve Locations

The locations of the check balls haven't changed over the years, however the springs have gone through some changes. Listed on the previous page are the spring sizes and weights.



AX4N
2001-On Check Ball and Relief V alve Location

Manual Low Relief Valve and Cooler Bypass Spring

Spring Weight 7.00 lbs. Spring size .634" in

Modulator Check Valve and Drainback Spring

Spring Weight 1.00 lbs. Spring size .754" in

Solenoid Regulator Fliter

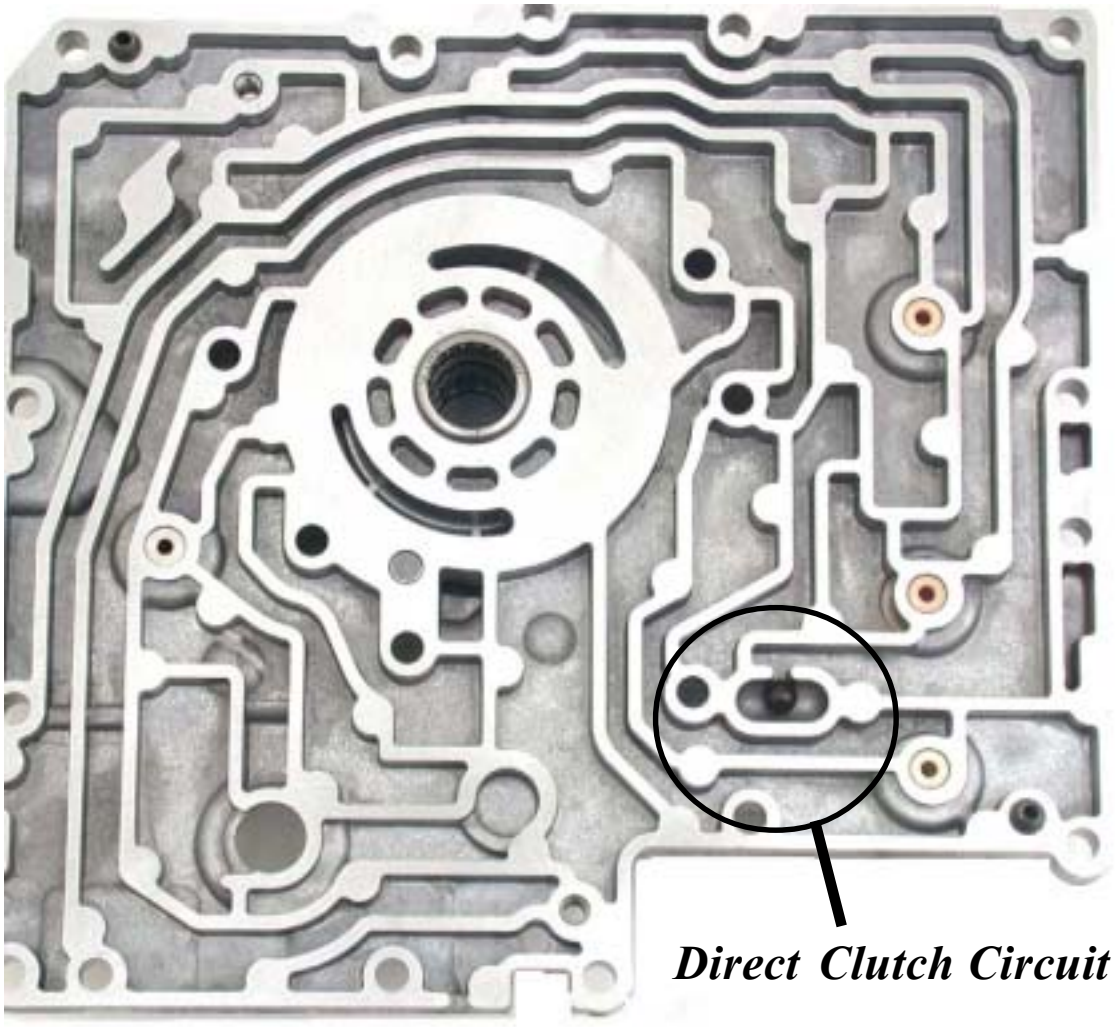
TCC Fliter

Modulator Check Valve and Spring

Spring Weight 1.75 lbs. Spring size .673" in

AX4N

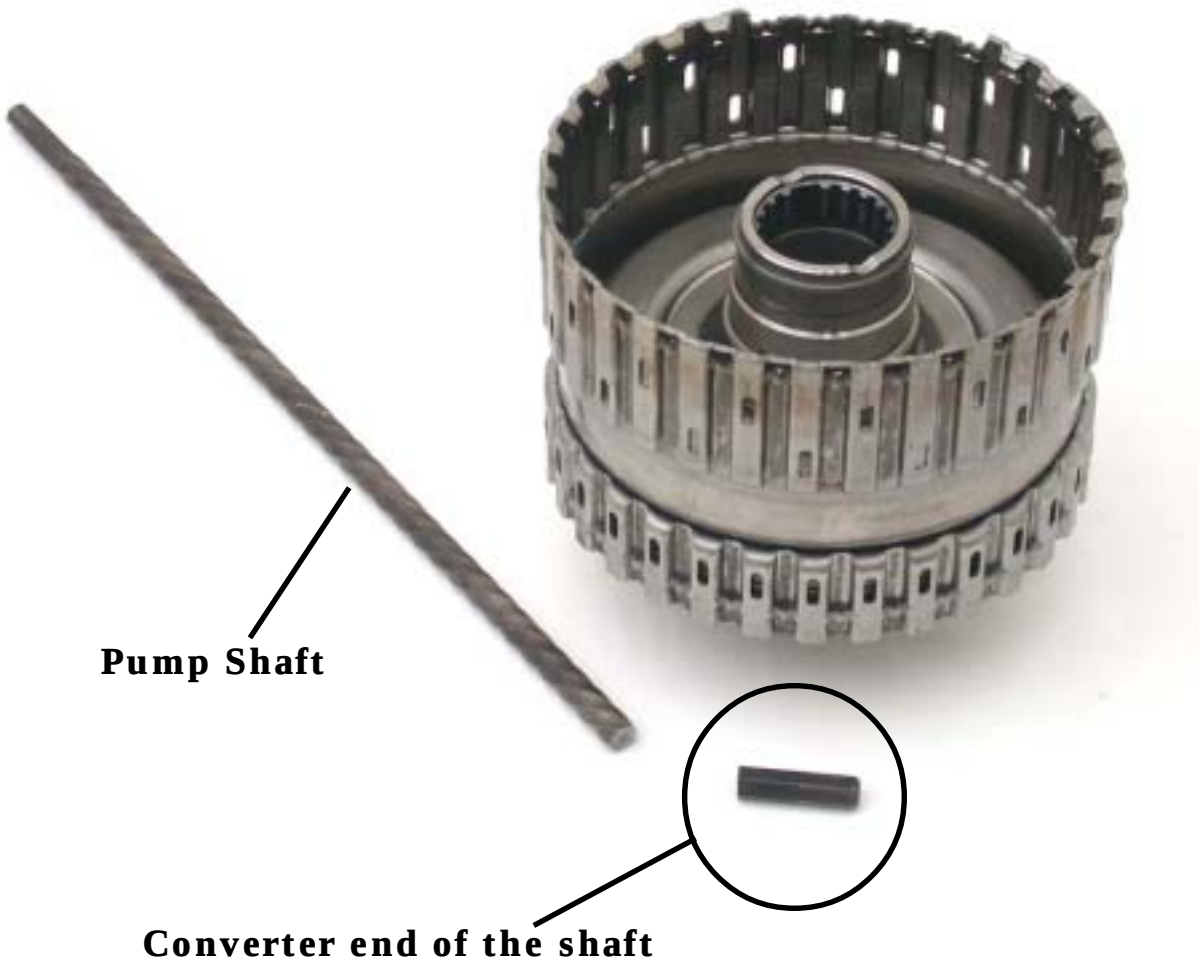
Check Ball Location



CD4E

No Movement After Overhaul

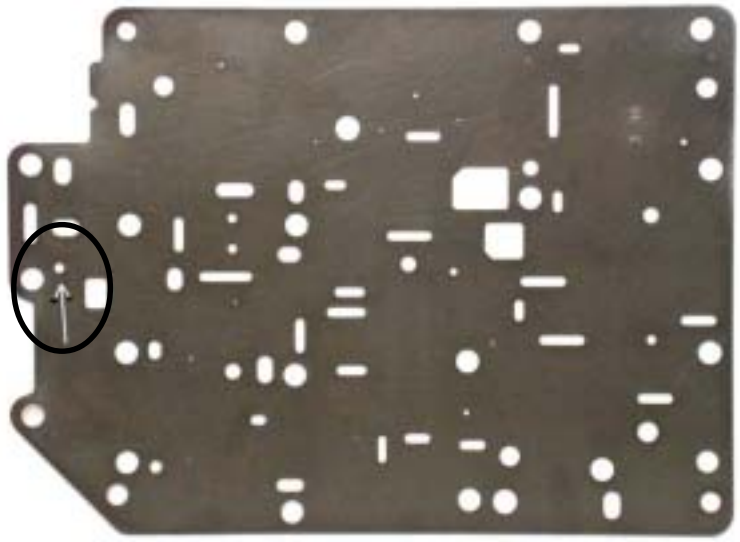
High Pressure caused by excessive clearance in the pressure regulator bore is causing the pump shaft to twist.



CD4E

Valve Body Mismatch

The Seperator plate can be an easy identification tool when interchanging the valve bodies. The location of the Forward feed hole is much larger on the 98' and later valve bodies.

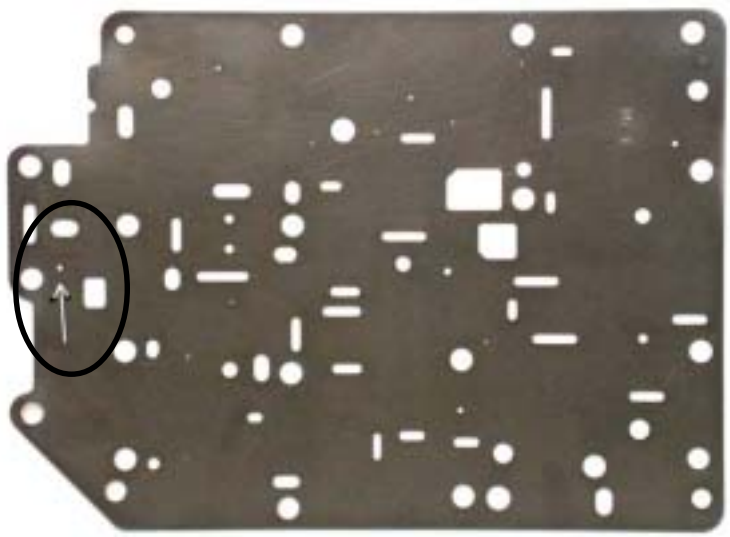


98' and later

0.120" With Wave plate in FWD clutch

94'-98' Models

0.090" No Wave plate in FWD clutch



CD4E
Valve Body Interchange

A wrong gear start from a stop or fourth gear in manual low condition may ocur if the valve body was replaced with the wrong valve body. Early, 1994-'97 and Late (1998-on) valve bodies can be identified by the Pull-In valve assembly and are not interchangeable? They must match vehicle.

CD4E

Valve Body Interchange with Harsh Forward Engagement or 3-4 Bind

Forward clutch assemblies with a wave plate are intended for use on later style valve bodies with the larger Forward feed orfice. Forward clutch assemblies without the wave plate are intended for use on earlier style valve bodies with the small forward feed orfice. If the Earlier style Drum assembly is installed to a Late model vehicle a harsh Froward engagement may be felt. This is due toe the large feed hole in the Seperator plate assembly.

EARLY 94-97

LATE 98-on

CD4E

Valve Body Interchange with Harsh Forward Engagement or 3-4 Bind

1st Design W/ shallow dish

2nd Design W/ deep dish

1st Design 0.315”

2nd Design 0.400”

CD4E

Valve Body Interchange with Harsh Forward Engagement or 3-4 Bind

1st Design 0.200”
Shallow Dish

2nd Design 0.310”
Deep Dish

1st Design 0.595”
Shallow Dish

2nd Design 0.680”
Deep Dish

CD4E

Valve Body Interchange with Harsh Forward Engagement or 3-4 Bind

A 3-4 Bind may be caused the Clearance of the Coast Clutch being incorrect. Install the coast clutch piston into the forward piston, then stack 2 coast clutch steels, 2 frictions and the forward apply plate on top. Clearance should be around 0.050” in.

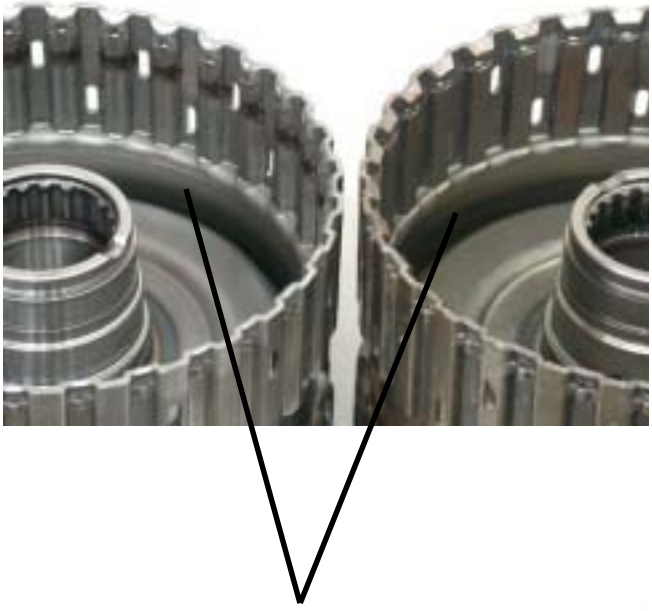
Other causes of this may be:

Â Forward Sprag (seized or wrong rotaion)
Â Cracked Forward piston
Â Crossleaks into the Coast Clutch

CD4E

Drives Forward in Nuetral, Binds in Reverse

After rebuild, when hot car drives forward in Neutral and binds in Reverse. This problem occurs after a Forward/Direct drum has been replaced. Care needs to be taken when replacing the forward/direct clutch drum. Make sure that the piston slides into the drum bore with a top clearance (top of drum bore for outer seal) of at least .010 or more. Always feel outer seal riding surface for being smooth. If it appears that the top area of the drum where the seal rides is ballooned inward and not a true straight flat surface, do not use this drum as it will swell when hot locking the forward piston from returning to its relaxed position. This creates a mechanical bind on the piston not releasing the forward clutches



Look at the Ridges in the Drum and Piston surface area

Make sure the Piston can sit in the Drum with a .010” feeler gauge

CD4E

Ratio Error Codes P0732, P0733, etc.

Turbine Speed Sensor Application

Some of the most troublesome codes to deal with are ratio error codes. These codes can be caused by a number of different concerns:

- Â Poor Line Pressure
- Â Sliping Clutches
- Â Bad Solenoids
- Â Wrong Fluid
- Â Bad Input from Engine Sensor
- Â Ignition Noise or Alternator Noise entering the VSS signal

Make sure you have the correct Turbine Speed sensor on the transaxle, the older sensors have a much broder range of voltage then the new sensors.

RPM	Hz	Old	New
Idle	00	.9-1.	.3-.8
2000	135	2.5	1.8
3000	206	3.5	2.4
4000	270	4.4	2.7

1S7Z-7M101-KA

F7RZ-7M101-KA

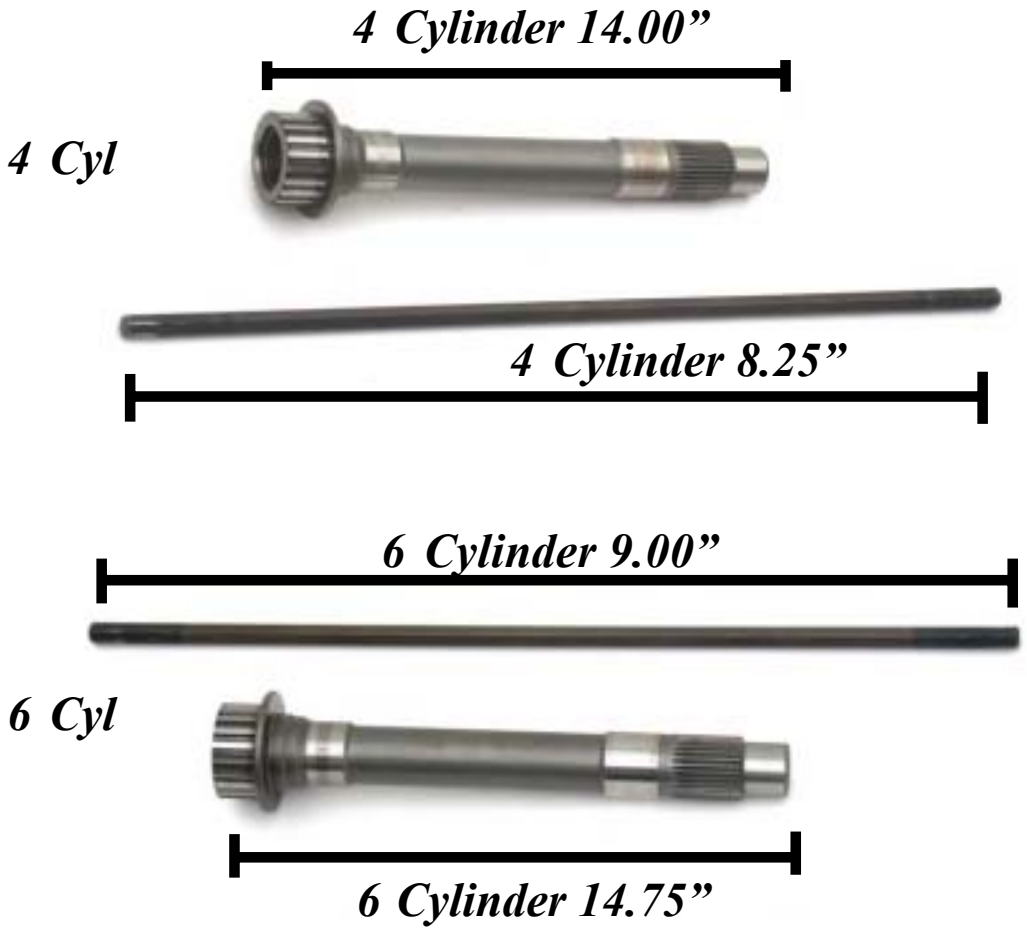
CD4E

Pump Shaft Identification

Pump, Converter, Engine Damage

It is very important to make sure you use the correct pump shaft and input shaft for the correct application. Mismatching the Input or Pump shafts may cause damage to the Pump, Crank Shaft Thrust Bearing, Converter and other internal parts.

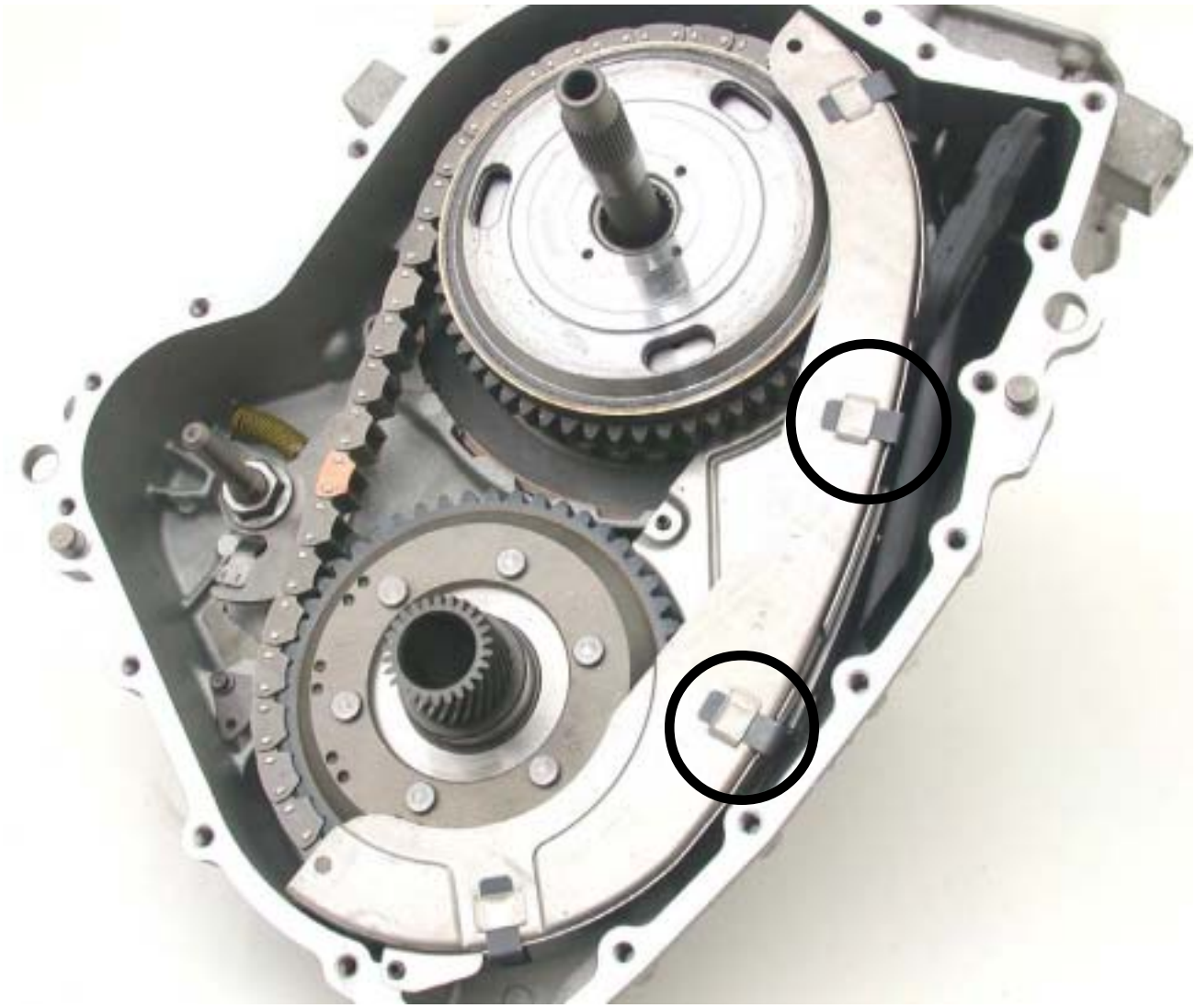
The Shafts are different in length between the 4Cyl. and 6Cyl. engines.



CD4E

Fluid Leaks Out Of The Dipstck Tube

The most common cause of this problem is the Chain cover not properly assembled. The chain cover has Four (4) snaps that connect to the shield. This sheild is typically misplaced or not installed at all.



CD4E
Proper Sprag Rotation

No Forward movement or Binds in fourth can be caused by the Forward sprag damaged or incorectly installed

Race freewheels counter-clockwise while holding the sun gear stationary

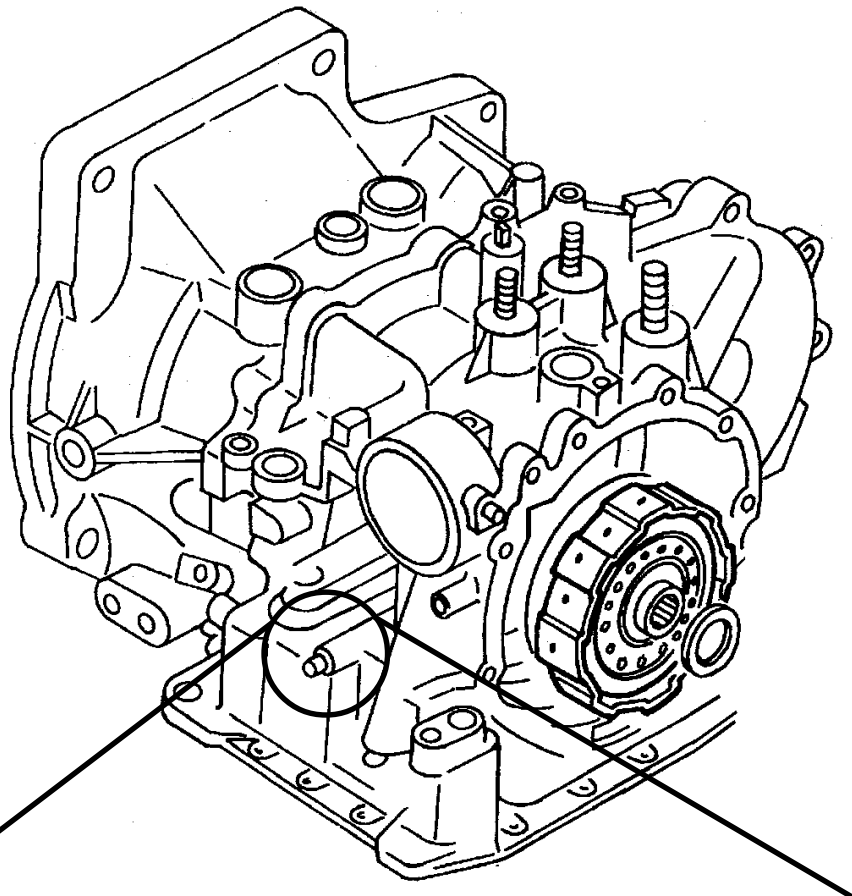
F4E-III
Clutch and Band Application

Gearshift Lever Position	Gear	2–4 Band	Reverse Clutch	Low/ Reverse Clutch	3–4 Clutch	Coasting Clutch	Forward Clutch	One-Way (Sprag) Clutch		One-Way (Roller) Clutch	
								Drive	Coast	Drive	Coast
R	Reverse		D	H							
(D)	First						D	D	OR	H	OR
(D)	Second	H					D	D	OR		
(D)	Third				D	A[1]	D	D	OR		
(D)	Fourth	H			D		A[2]	OR	OR		
D	Third				D	A[1]	D	D	OR		
L[3]	Second	H				A[1]	D	D	OR		
L	First			H[1]		A[1]	D	D	OR	H	OR
Planetary Member		Rear (Large) Sun Gear and Drum	Rear (Large) Sun Gear and Drum	Front Planet	Front Planet	Primary (Small) Sun Gear	One-Way (Sprag) Clutch	Primary (Small) Sun Gear		Front Planet	

[1] For engine braking only.
[2] Applied but does not transfer power.
[3] For overspeed protection only (during manual downshift).

OR = Overrunning.
D = Driving.
H = Held.
A = Applied.

F4E-III
Pressure Specifications



Range	Line Pressure, (psi) P, (D), D, L	Line Pressure, (psi) R
Idle	(62-81)	(110-120)
Stall Speed	(140-152)	(217-248)

F4E-III

Solenoid Firing Order

Shift Pattern				
	SSA (1)	SSB (2)	SSC (3)	TCC
Reverse				
1ST		X	X*	
2nd	X	X	X*	X*
3rd During Shift			X*	X*
3rd After Shift	X			X*
4th	X		X	X*

*Can be commanded by the PCM during shift.

Coast Down Shift				
	SSA (1)	SSB (2)	SSC (3)	TCC
4th	X		X	X*
Above 20 mph				
Below 20 mph			X	
Below 10 mph				
Stop 0 mph		X	X	

FAILSAFE			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
2nd in Manual Low			
3rd in Manual 2 and D Position			

F4E-III
Solenoid Failure Chart

SSA (1) Always OFF			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
1st		X	X
2nd		X	
3rd			X
3rd			

SSB (2) Always OFF			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
4th	X		X
3rd	X		
3rd			X
3rd			

SSC (3) Always OFF			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
1st		X	
2nd	X	X	
3rd	X		
3rd			

F4E-III

Solenoid Failure Chart

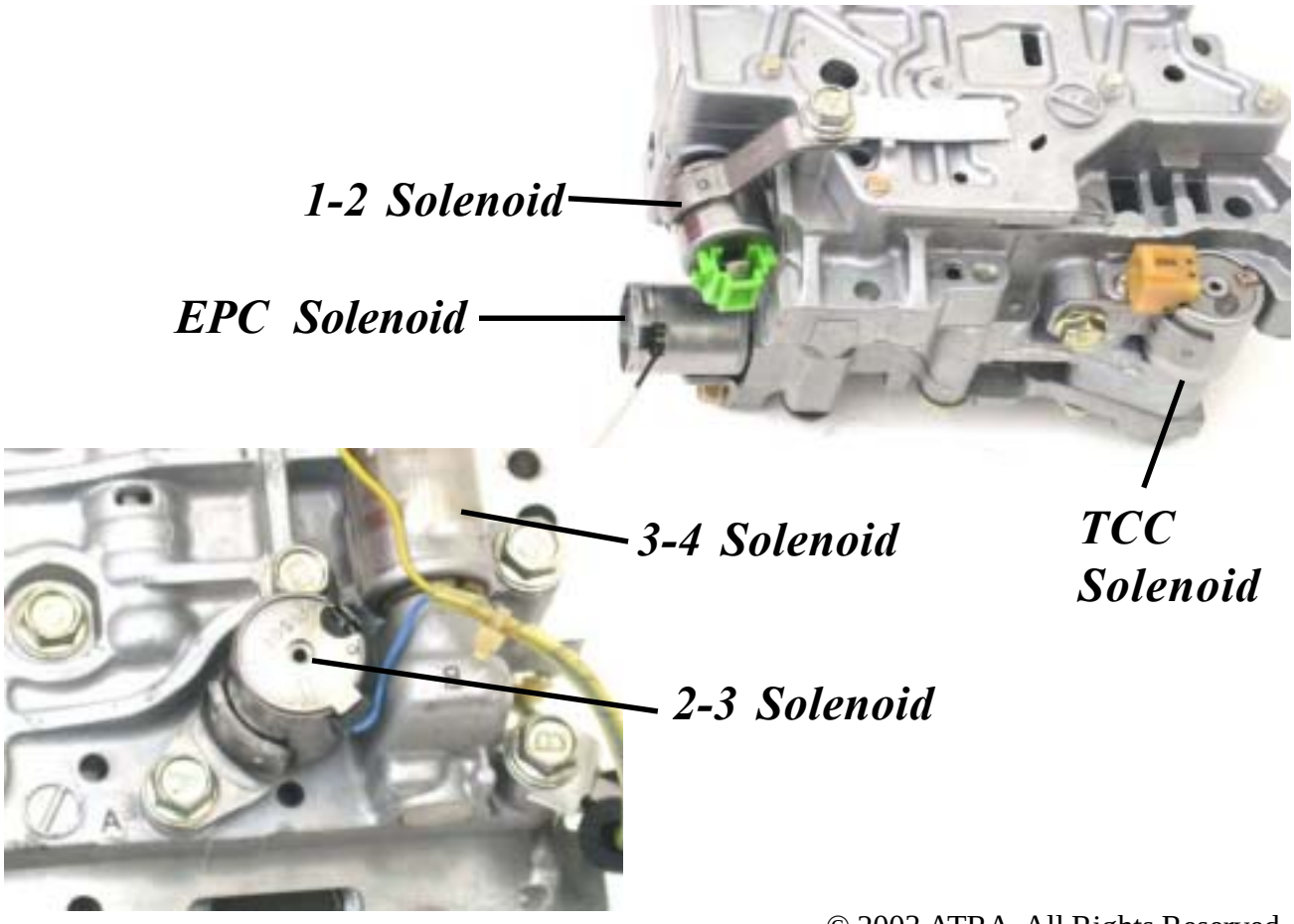
SSA (1) Always ON			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
2ND	X	X	X
2nd	X	X	
3rd	X		
4th	X		X

SSB (2) Always ON			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
1ST		X	X
2nd	X	X	X
2ND	X	X	
1ST		X	

SSC (3) Always ON			
	SSA (1)	SSB (2)	SSC (3)
Reverse			
1ST		X	X
2nd	X	X	X
3rd with Engine Braking			X
4th	X		X

F4E-III
Solenoid Specifications

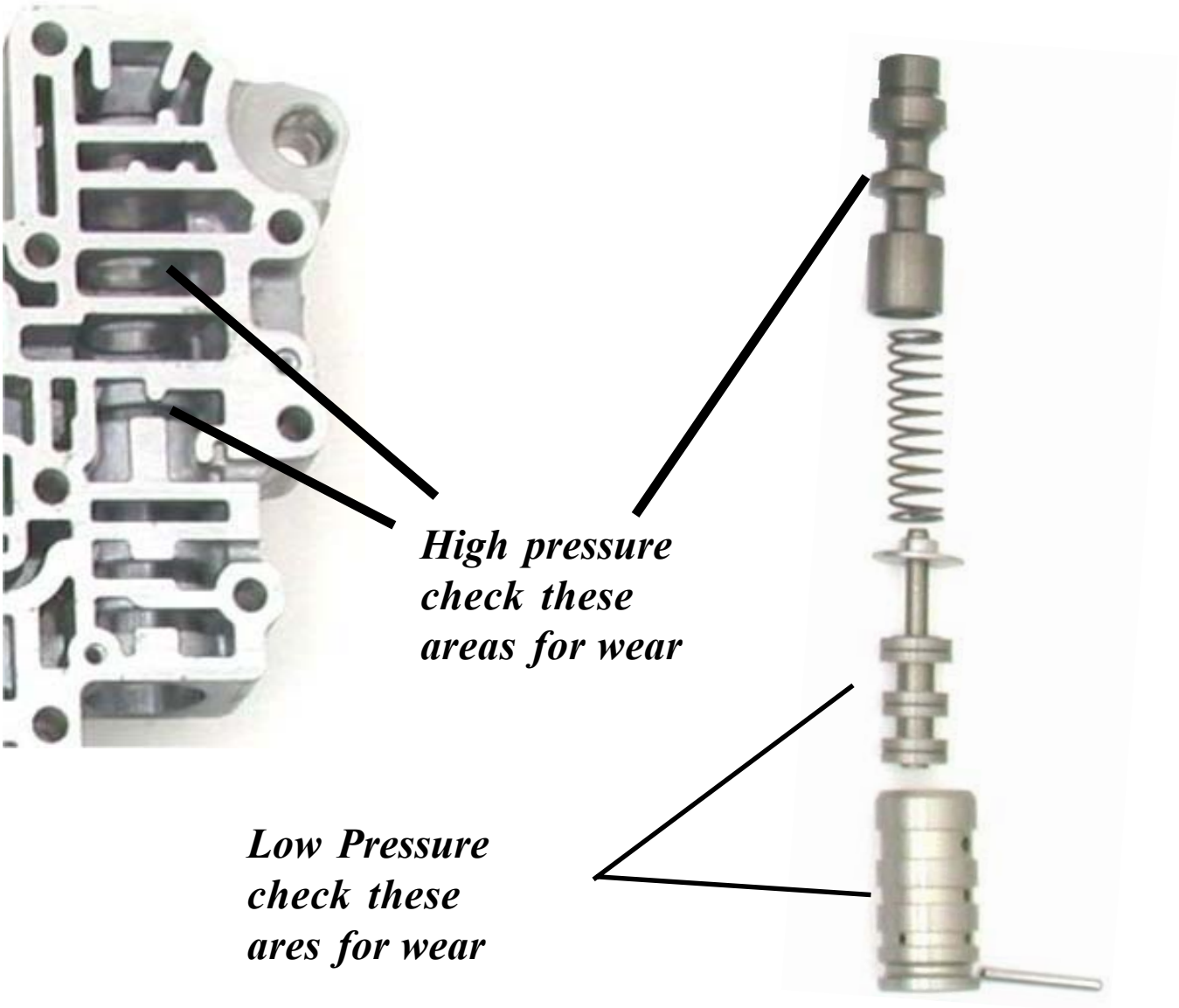
F4E-III Solenoid Specifications	
Solenoid	**ohms**
1-2	12-20
2-3	12-20
3-4	12-20
TCC	12-20
EPC	1-4



F4E-III

High / Low Pressure

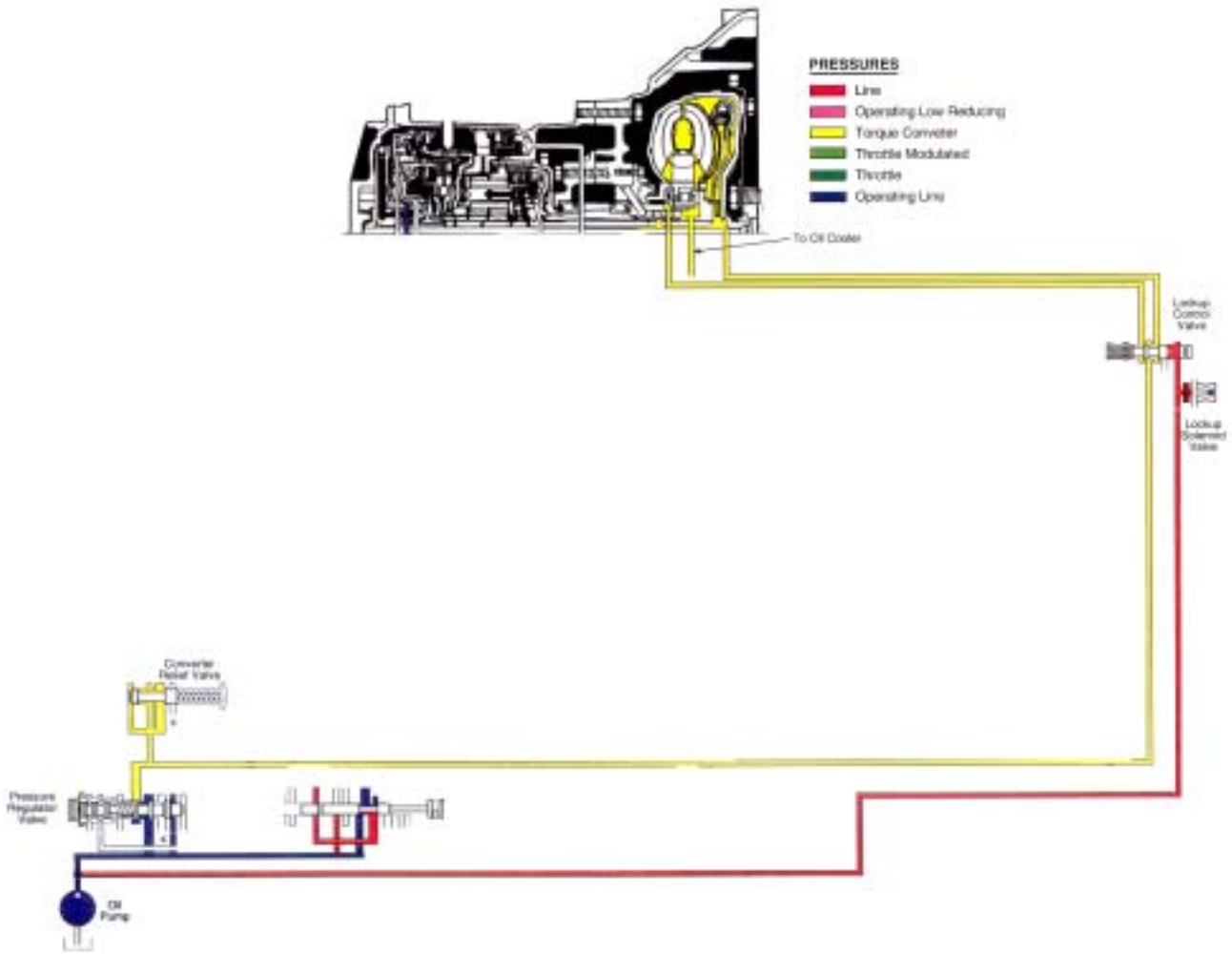
High Pressure caused by Pressure Regulator bore wear.



F4E-III

No Movement in all Gears af ter Rebuild

Typically caused by a damaged Pressure Regulator circuit, this problem is usually assosiated with a plant failure. During your rebuild proceedure make sure the Pressure Regulator Valve assembly is not damaged. A damaged PR Valve can create high line pressure, this can cuase no cooler flow resulting no movement.



F4E-III
Ratio Codes

Ratio codes can be very difficult to diagnose because of the many different components that can cause this problem. Diagnostic Trouble Codes P0781, P0782, P0783, P1731, P1732, P1733 indicate incorect ratios and no specific gear. In order for these codes to set, the problem has to happen four times consecutivly. Diagnostic Trouble Codes P0741 or P1728 are also ratio codes that can be percieved as only torque converter codes. In order for these codes to set the problem has to happen five times consecutively. Here are some of the items to look at when diagnosing Ratio Codes:

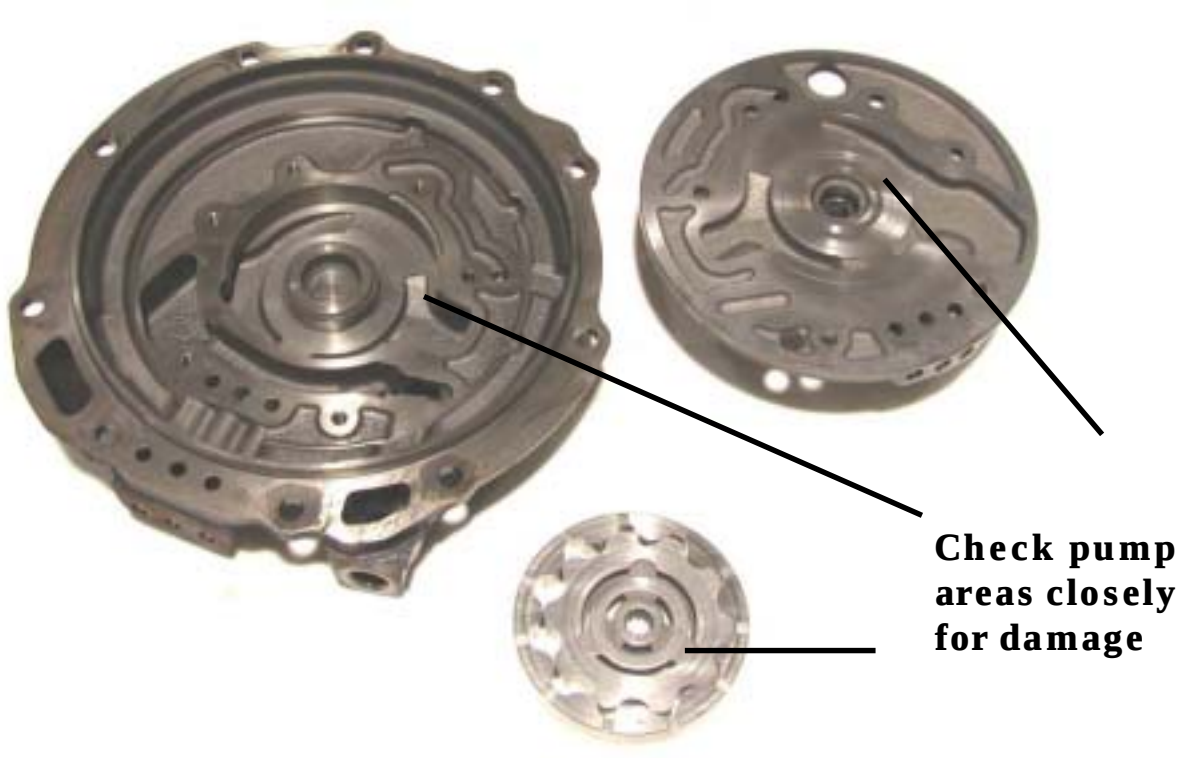
- ***Fluid Pump***
- ***Filter***
- ***Valve Body Wear***
- ***Seals***
- ***Drums***
- ***Speed Sensors***
- ***Accumulators***

F4E-III

Ratio Codes (Continued)

Pump

The front pump support and gear provides the volume of fluid required to charge the torque converter, main control valve body, cooling system, lubrication system, and hydraulic apply devices. The front pump support and gear is shaft driven by the torque converter cover. The sideclearance should be no more then .002, .0015 or less is prefered.



F4E-III

Ratio Codes (Continued)

Filter

If a transmission repair is being perfromed for a contamination-related failure, always use a new filter and grommet. Many people think that simply cleaning a screen filter will work, but this is not always the case. Small particles can become logged in the screen and restrict flow, causing slips, and ratio errors.

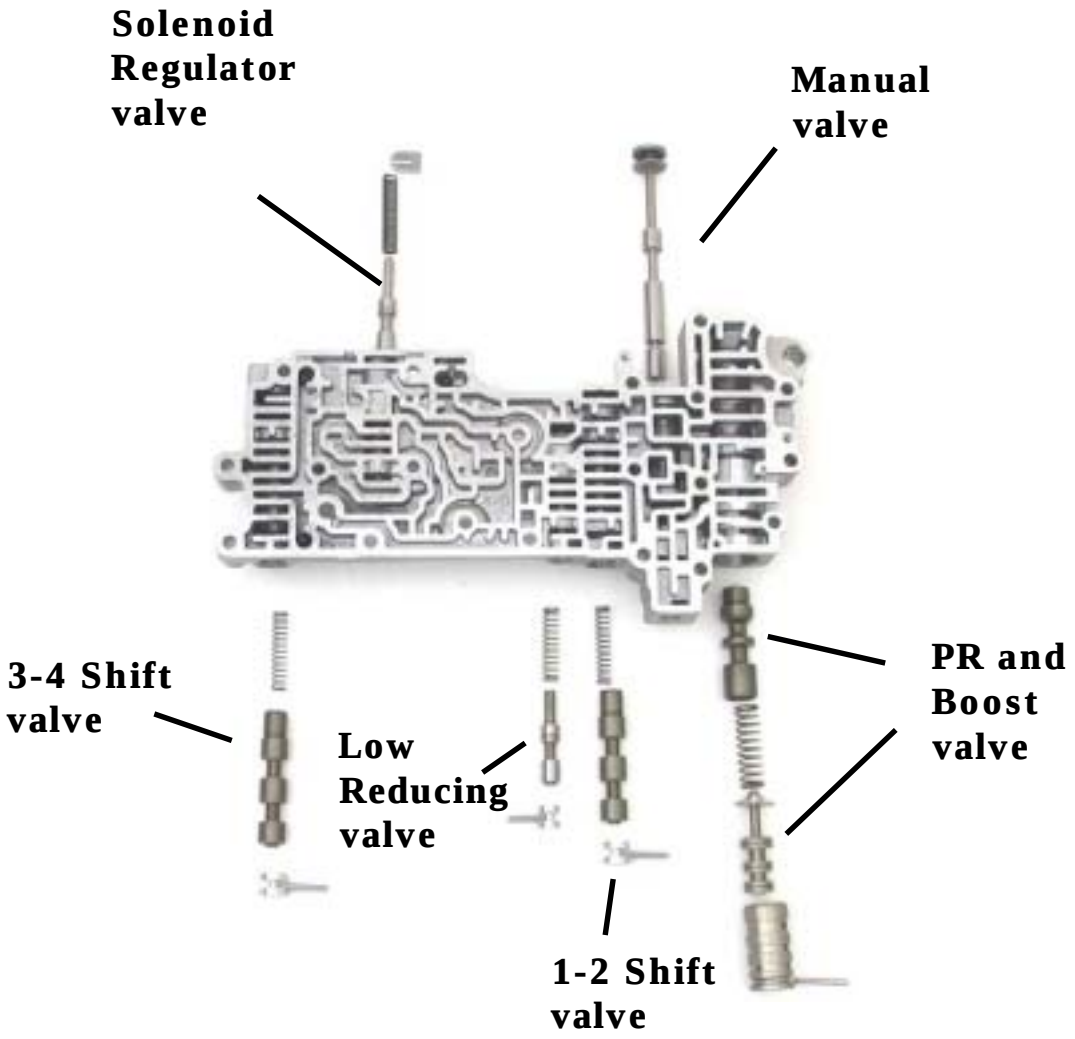
F4E-III

Ratio Codes (Continued)

Valve Body Wear

The valve body consists of four sections: the upper control valve body, main control valve body, premain control valve body, and the lower control valve body. The main control valve body also contains the electronic pressure control solenoid.

Wear in the 1-2 shift valve can cause a ratio code simply by not stoking properly and slowing down the timing the PCM is expecting.



F4E-III

Ratio Codes (Continued)

Seals and Drums

A bad seal or drum can be a difficult problem to diagnose. Some areas to look at are the sealing surfaces of the piston and drum assembly. A slipping Forward clutch can cause sluggish engagements into Drive. Here again knowing what's applied will help you diagnosis this unit quickly.

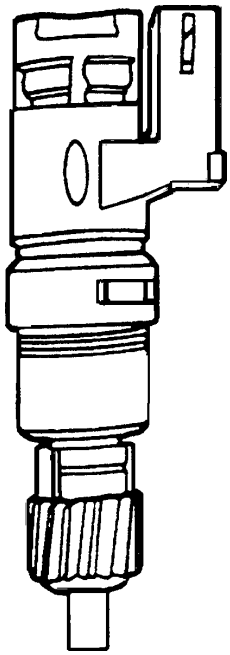
F4E-III

Ratio Codes (Continued)

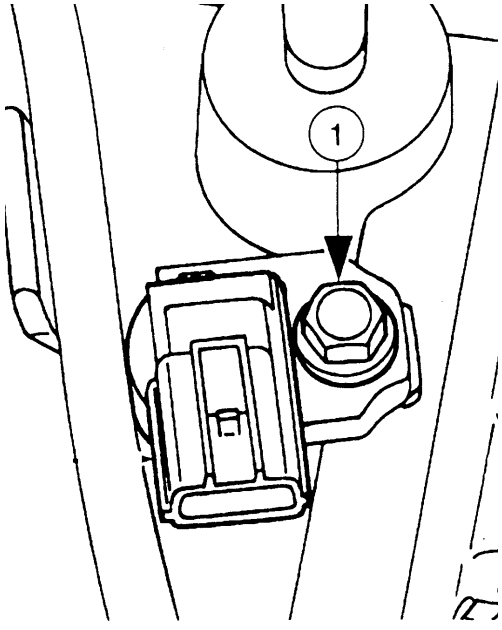
Speed Sensors

The vehicle speed sensor (VSS) is located above the differential on the transmission case. The VSS rotates a cable and the instrument cluster generates a DC signal and sends the signal to the PCM, in some cases the VSS generates the signal to the PCM. The TSS sensor provides converter turbine shaft speed information for torque converter clutch (TCC) control strategy. The information is also used in determining static electronic pressure control (EPC) pressure setting during shifts. The values below are approximate, the important point is that the frequency rise is linear and smooth.

Failure: *All or some shifts missing, erratic shift pattern, Stall when put into gear, late/early shift speeds,no TCC, Erratic pressure rise.*



80mph-170 Hz +/-
60mph-130 Hz +/-
30mph- 75 Hz +/-
15mph- 40 Hz +/-
00mph- 00 Hz +/-



VSS 150-250 ohms

TSS 150-250 ohms

F4E-III

Ratio Codes (Continued)

Accumulators

Accumulators — 1-2

Spring
Length 3.425
Diameter 0.630
Coil 0.080

Accumulators — 2-3

Outer Length	**2.729**
Outer Diameter	**0.580**
Outer Coil	**0.078**
Inner Length	**2.665**
Inner Diameter	**0.396**
Inner Coil	**0.052**

F4E-III

Ratio Codes (Continued)

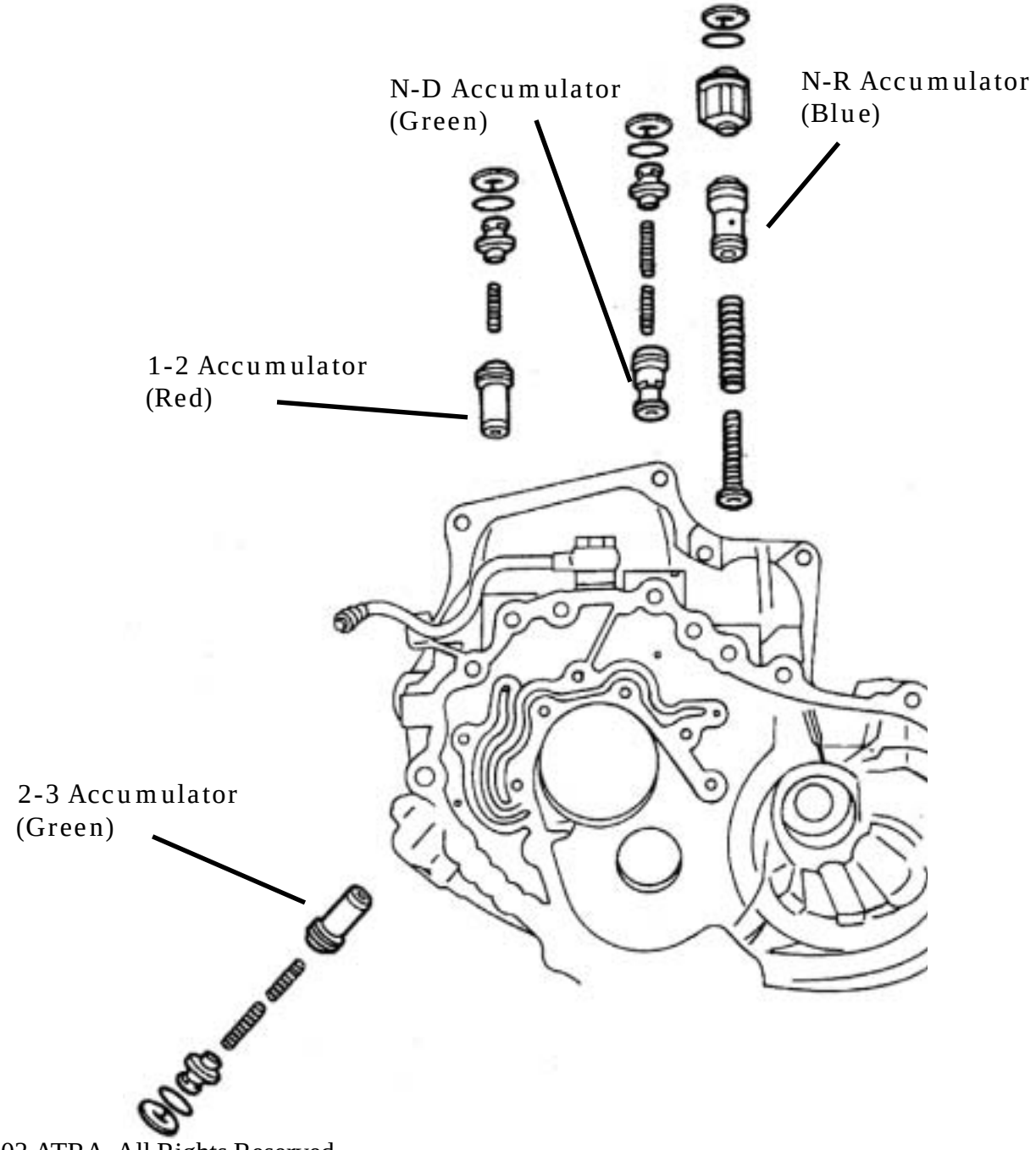
Accumulators — N-D

Outer Length	**2.954**
Outer Diameter	**0.580**
Outer Coil	**0.062**
Inner Length	**2.802**
Inner Diameter	**0.420**
Inner Coil	**0.047**

Accumulators — N-R

Outer Length	**4.134**
Outer Diameter	**0.553**
Outer Coil	**0.066**
Inner Length	**3.657**
Inner Diameter	**0.384**
Inner Coil	**0.050**

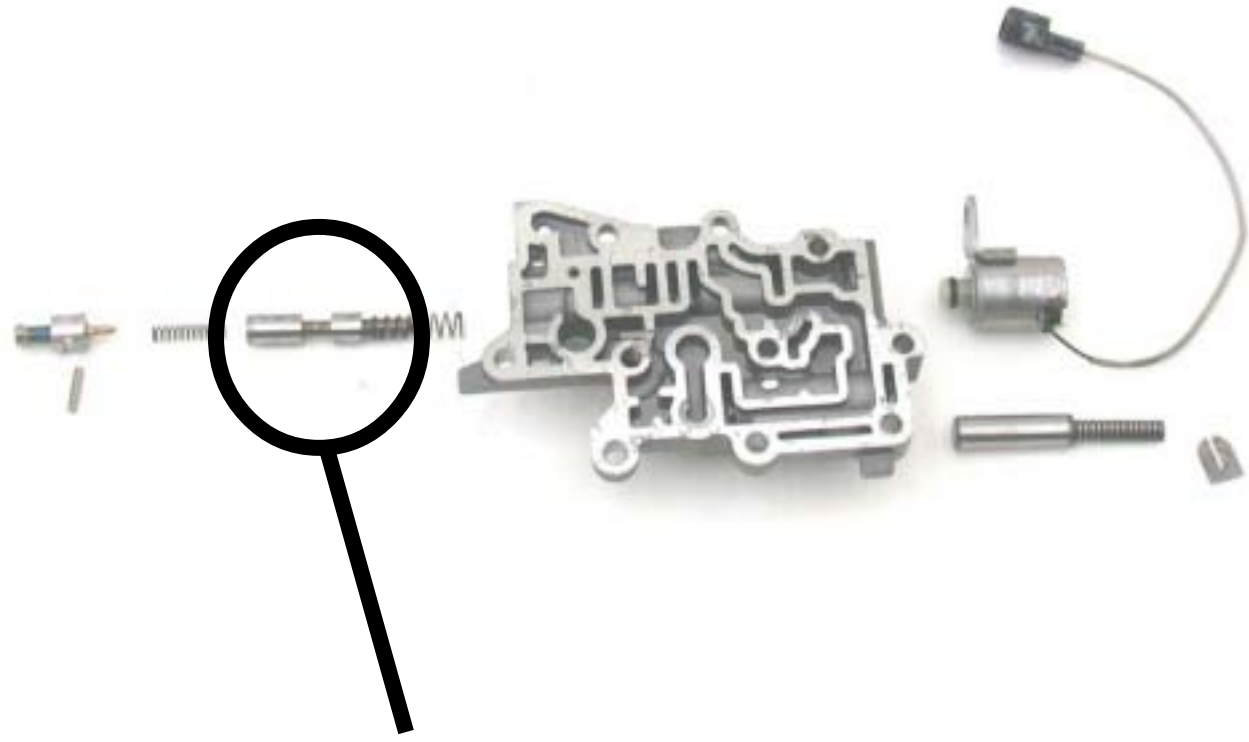
F4E-III
Accumulator Reference



F4E-III

No Line Rise W/ Good EPC Command

No Line rise can be caused by a sticking pressure modifier valve or a damaged spring. The Line Pressure Modulator Valve is responsible for modulating the EPC pressure and distributing it to the appropriate valves.



Check the valve for scoring and make sure the valve bore is clean of debris.

F4E-III

After Rebuild, Slipping 2nd and 4th, No 2nd and 4th

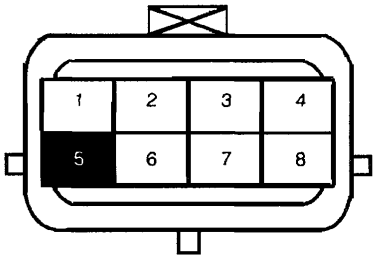
The Orifice size is .020” in

Always take the time to remove the servo apply orifice.

F4E-III

Jump Testing the Transmission

Ford's F4EIII



Transmission Connector Identification

ID	Function
1	EPC Solenoid
2	TFT Sensor (-)
3	Shift Solenoid 3
4	Shift Solenoid 1
5	Empty
6	TFT Sensor (+)
7	TCC Solenoid
8	Shift Solenoid 2

Signal Monitor Connection

Backprobe the terminals with the harness connector still connected.

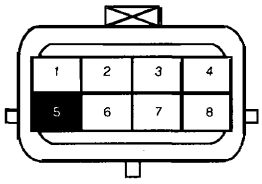
Red Boot *Terminal 4*
Yellow Boot *Terminal 8*
Green Boot *Terminal 3*

Black Boot,
Yellow Boot; Black Band
Green Boot; Black Band, All connect to ground

Electronic Pressure Control

Backprobe the terminals with the harness connector still connected.

To check the electronic pressure control signal, connect the positive (+) lead of your high-impedance voltmeter to terminal 1, connect the negative (-) lead to ground.

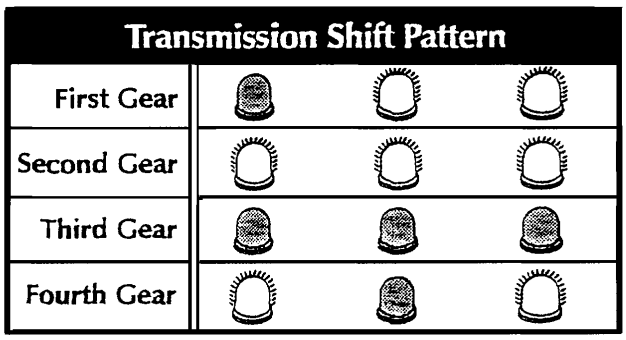


Solenoid Sequence

Gear	SS1	SS2	SS3
1	OFF	ON	ON
2	ON	ON	ON
3	OFF	OFF	OFF
4	ON	OFF	ON

Note: Shift solenoids are normally closed feed/bleed system type.

This is the shift pattern you should see with your signal monitor:

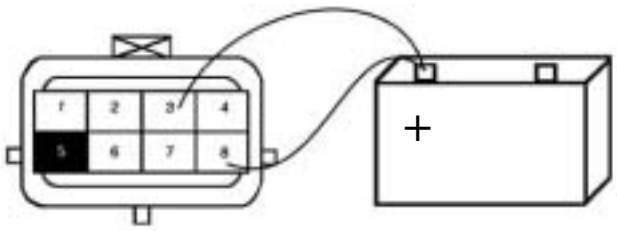


All three LEDs are required to check the shift command pattern.

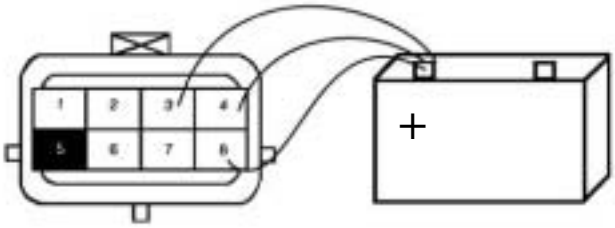
F4E-III

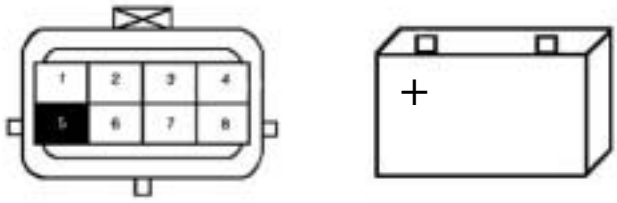
Jump Testing the Transmission

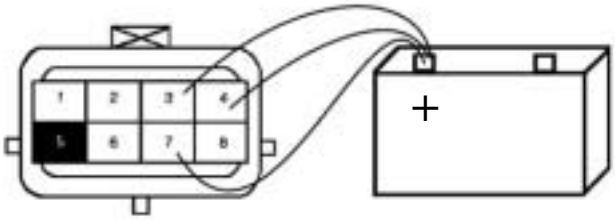
F4E-lll connector assembly veiwed from the terminal side.



WIRE COLORS		
1	BL	EPC INPUT
2	BK/TN	TFT
3	OR	SSC (3)
4	PK/LB	SSA (1)
5	EMPTY	
6	PL/WT	SIGNAL RETURN
7	BRN	TCC
8	GY/LB	SSB (2)





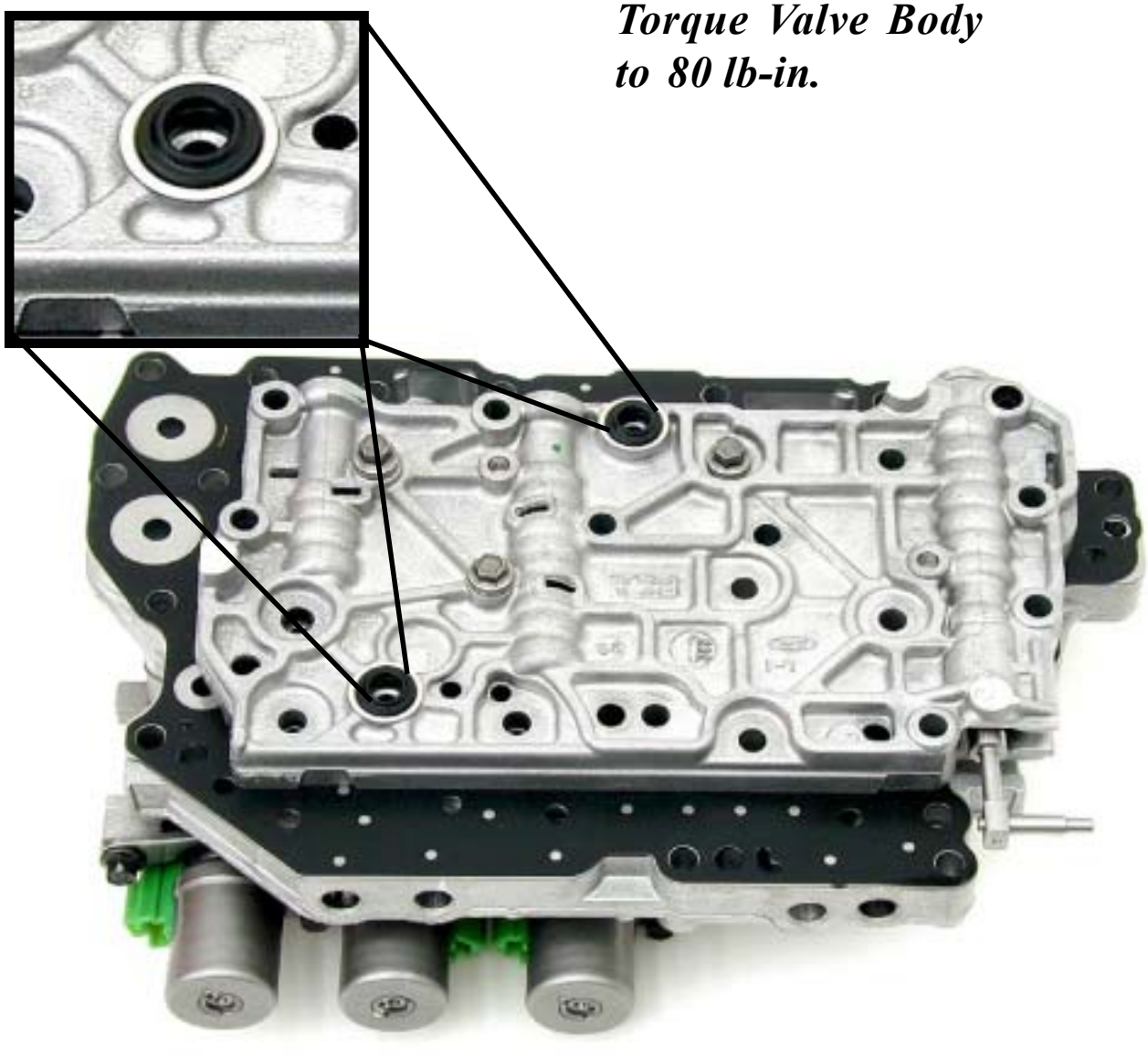


#7 indicates TCC

4F27E
Servo Seal Damaged

It is important to install the Servo seal to the Valvebody correctly make sure there are no tears in the lip of the seal and that there is no knicks on the Valvebody seal surface. Make sure you torque the Valvebody to specifications and air check the unit after. A loose valve body can cause the seals to tear from the oil pressure passing the feed.

Torque Valve Body to 80 lb-in.



4F27E
Final Drive Gear Set

A reprogram is availible for the PCM (Powertrain Control Module) to accept an ealier gearset in a late vehicle. In Ealy 2002 Ford introduced a reprogram for this interchange.

If the transaxle has a part number on it that starts with an X for the year 2000 (ex:XS4P) it contains the older gear set. Transaxles with part numbers that begin with 1 for the year 2001 (ex: 1S4P) it contains a newer gear set.

To identify the correct reprogram locte the tear tag on the door and match the tag number with the following chart.

The early output gear has 87 teeth and the transfer gear has 83 teeth

The late output gear has 59 teeth and the new transfer gear has 57 teeth.

Transfer Gear

Output Gear

4F27E
Final Drive Gear Set

2000 Model Year 4F27E Transaxle with SPI Engine

Use this chart as a guide to upgrade the PCM calibrations when rebuilding or repairing a transmission and using the new gear ratio with the SPI engine

Rebuild/Replace 4F27E FN Trans Part Number 1S4P-CF (New 3.733 FDR)

Original Calibration	Original PCM	Tear Tag		New Calibration	New PCM	Tear Tag
0AK15S0511	98AB-12A650-AMH	FVV7	>	0AK15S0511	YU7Z-12A650-DA	OOQ0
0AK15S0512	98AB-12A650-AMJ	FVV8	>	0AK15S0512	YU7Z-12A650-DA	OOQ0
0AK15S0513	98AB-12A650-AMK	FVV9	>	0AK15S0513	YU7Z-12A650-DA	OOQ0

2000 Model Year 4F27E Transaxle with Zetec Engine

Use this chart as a guide to upgrade the PCM calibrations when rebuilding or repairing a transmission and using the new gear ratio with the Zetec engine

Rebuild/Replace 4F27E FN Trans Part Number 1S4P-DF (New 3.956 FDR)

Original Calibration	Original PCM	Tear Tag		New Calibration	New PCM	Tear Tag
0AK15Z0511	98AB-12A650-AHH	LDC7	>	0AK15Z0511	YU7Z-12A650-DVA	INU0
0AK15Z0512	98AB-12A650-AHJ	LDC8	>	0AK15Z0512	YU7Z-12A650-DVA	INU0

2001 Model Year 4F27E Transaxle with SPI Engine

Use this chart as a guide to upgrade the PCM calibrations when rebuilding or repairing a transmission and using the new gear ratio with the SPI engine

Rebuild/Replace 4F27E FN Trans Part Number 1S4P-CF (New 3.733 FDR)

Original Calibration	Original PCM	Tear Tag		New Calibration	New PCM	Tear Tag
1AK1AS0507	1S4F-12A650-LD	BVP3	>	1AK1AS0516	1M5Z-12A650-MB	QOW1
1AK1AS0510	1S4F-12A650-LE	BVP4	>	1AK1AS0516	1M5Z-12A650-MB	QOW1
1AK1AS0515	1M5F-12A650-MA	QOW0	>	1AK1AS0516	1M5Z-12A650-MB	QOW1
1AK1AS0A06	1S4F-12A650-ACC	RXV2	>	1AK1AS0A16	1M5Z-12A650-NB	IBE1
1AK1AS0A10	1S4F-12A650-ACD	RXV3	>	1AK1AS0A16	1M5Z-12A650-NB	IBE1
1AK1AS0A15	1M5F-12A650-NA	IBE0	>	1AK1AS0A16	1M5Z-12A650-NB	IBE1

2001 Model Year 4F27E Transaxle with Zetec Engine

Use this chart as a guide to upgrade the PCM calibrations when rebuilding or repairing a transmission and using the new gear ratio with the Zetec engine

Rebuild/Replace 4F27E FN Trans Part Number 1S4P-DF (New 3.956 FDR)

Original Calibration	Original PCM	Tear Tag		New Calibration	New PCM	Tear Tag
1AK1AZ0509	1S4F-12A650-MF	JFR5	>	1AK1AZ0510	1U7Z-12A650-EA	K8M0
1AK1AZ0510	1S4F-12A650-MG	JFR6	>	1AK1AZ0510	1U7Z-12A650-EA	K8M0
1AK1AZ0515	1S4F-12A650-PA	CJW0	>	1AK1AZ0516	1M5Z-12A650-PB	CJW1
1AK1AZ0A09	1S4F-12A650-ADF	SZR5	>	1AK1AZ0A10	1U7Z-12A650-FAA	VVM0
1AK1AZ0A10	1S4F-12A650-ADG	SZR6	>	1AK1AZ0A10	1U7Z-12A650-FAA	VVM0
1AK1AZ0A15	1M5F-12A650-RA	XAU0	>	1AK1AZ0A16	1M5Z-12A650-RB	XAU1

4F27E

2 / 4 Band Adjustment

Band adjustment is crucial during a rebuild. Many times a repeat failure of the band will occur because the specified bolt was not installed. This tool can be purchased from the after market.

OTC# 307-416

4F27E
2 / 4 Band Adjustment

When an adjustment is necessary be sure to follow the procedure listed below:

Â Tighten the band select gauge tool to 45 lb-in

Â Back out the gauge 3 ½ turns

Â Holding the tool bolt in position, lightly seat the nut and washer against the transaxle case

Â Remove the tool without changing the position of the nut on the bolt

4F27E
2 / 4 Band Adjustment

Â Compair the 2/4 band anchor bolt with the measurement tool
Â If the adjustment is off use the chart to verify the correct pin

Anchor Bolt Selection Chart		
Part Number	**Bolt Head Number**	**Bolt Length**
XS4Z9F206GB	7	39.0 mm
XS4Z9F206FB	6	38.5 mm
XS4Z9F206EB	5	38.0 mm
XS4Z9F206DB	4	37.5 mm
XS4Z9F206CB	3	37.0 mm
XS4Z9F206BB	2	36.5 mm
XS4Z9F206AB	1	36.0 mm

4R44/55E and 5R44/55E
Low Line Pressure at WOT, Slipping

Explorer, Ranger, Aerostar, Mountaineer

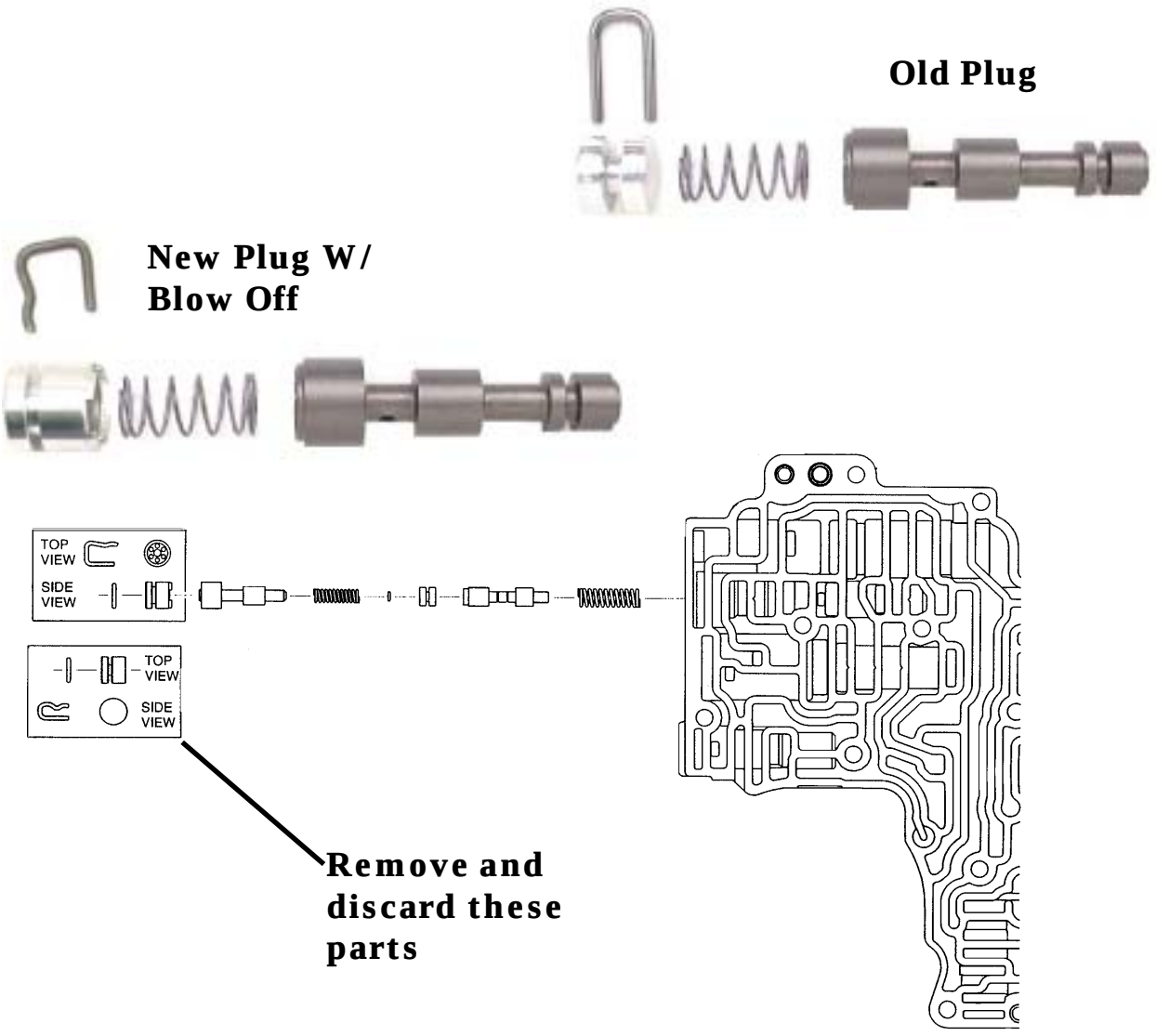
Low line pressure at WOT, seperator plate gasket blown, erratic EPC pressure are some common problems with 1995 -2002 4R and 5R series transmissions. Some other complaits may be:

- Â No Line Rise at WOT
- Â No 2nd Gear
- Â No 3rd Gear
- Â No engine breaking in Manual 1
- Â Slipping shifts and/or delayed engagements
- Â DTCs P0732, P0733, or P1762 may be present

The seperastor plate orifice sizing has been changed to repair this problem, a new Seperator plate is now availible from Ford. In some cases due to heavy contamination the Valve Body will need to be replaced if there isn't a heavy amount debris in the pan refer to chart for specific seperator part number.If it is determaned the valve body needs replacing refer to chart on the opposite page.

4R44/55E and 5R44/55E
Low line Pressure at WOT

When replacing the separator plate and EPC blow off plug, remove and discard the old solid plug and clip assembly. The new plug has a check valve in the plug that allows excessively high EPC oil pressure to escape without damaging the valve body or other internal complaints.



4R44/55E and 5R44/55E
Low line Pressure at WOT

Procedure A - Parts Application Chart			
Vehicle Application	**Engineering Description**	**Qty.**	**New Service Part**
	95/96 Models ONLY		
96 Aerostar 3.0L/4.0L	Control Assy - Main	1	F5TZ-7A100-CB
95/96 3.0L/4.0L Ranger/Explorer	Control Assy - Main	1	F5TZ-7A100-CB
95/96 2.3L Ranger	Control Assy - Main	1	F57Z-7A100-RA
	97 Models ONLY	1	
97 2.3L Ranger	Control Assy - Main	1	F77Z-7A100-FA
97 3.0L OHV Ranger/Aerostar	Control Assy - Main	1	F77Z-7A100-GA
97 4.0L OHV Ranger/Aerostar	Control Assy - Main	1	F79Z-7A100-AA
97 4.0L OHV Explorer/Mountaineer	Control Assy - Main	1	F77Z-7A100-HA
97 4.0L SOHC Explorer/Mountaineer	Control Assy - Main	1	F77Z-7A100-JA
	1998-2001 Models ONLY		
98/01 2.5L Ranger	Control Assy - Main	1	XL2Z-7A100-AB
98/00 3.0L Ranger	Control Assy - Main	1	XL2Z-7A100-BB
98/00 4.0L - EI Ranger	Control Assy - Main	1	XL2Z-7A100-CB
98/00 4.0L - EI Explorer	Control Assy - Main	1	XL2Z-7A100-DB
98/00 4.0L - SOHC	Control Assy - Main	1	XL2Z-7A100-EB
	2001-2002 Models ONLY		
2001/2002 2.3L Ranger	Control Assy - Main	1	1L5Z-7A100-AB
2001/2002 3.0L Ranger	Control Assy - Main	1	1L5Z-7A100-BC
2001/2002 4.0L-SOHC	Control Assy - Main	1	1L5Z-7A100-CC

4R44/55E and 5R44/55E
Low line Pressure at WOT

Procedure B - Parts Application Chart			
Vehicle Application	**Engineering Description**	**Qty.**	**New Service Part**
	95/97 Models ONLY		
95/97 Models - ALL	Separator Plate to Case Gasket	1	2L5Z-7C155-AA
95/97 Models - ALL	Separator Plate to Main Control Gasket	1	2L5Z-7D100-BA
	95/96 Models ONLY		
95/96 Models - ALL	Plate - Valve Body Separator	1	F5TZ-7A008-CA
		1	
	97 Models ONLY		
97 2.3L Ranger	Plate - Valve Body Separator	1	F77Z-7A008-AB
97 3.0L OHV Ranger/Aerostar	Plate - Valve Body Separator	1	F77Z-7A008-AB
97 4.0L OHV Ranger/Aerostar	Plate - Valve Body Separator	1	F77Z-7A008-CB
97 4.0L OHV Explorer/Mountaineer	Plate - Valve Body Separator	1	F77Z-7A008-DB
97 4.0L SOHC Explorer/Mountaineer	Plate - Valve Body Separator	1	F77Z-7A008-EB
	1998-2001 Models ONLY		
98/01 2.5L Ranger	Plate - Valve Body Separator	1	1L5Z-7Z490-DA
98/00 3.0L Ranger	Plate - Valve Body Separator	1	1L5Z-7Z490-EA
98/00 4.0L - EI Ranger	Plate - Valve Body Separator	1	1L5Z-7Z490-FA
98/00 4.0L - EI Explorer	Plate - Valve Body Separator	1	1L5Z-7Z490-GA
98/00 4.0L - SOHC	Plate - Valve Body Separator	1	1L5Z-7Z490-HA
	2001-2002 Models ONLY		
2001/2002 2.3L Ranger	Plate - Valve Body Separator	1	1L5Z-7Z490-AA
2001/2002 3.0L Ranger	Plate - Valve Body Separator	1	1L5Z-7Z490-BA
2001/2002 4.0L-SOHC	Plate - Valve Body Separator	1	1L5Z-7Z490-CA

5R55N
Clutch and Band Application

Band/Clutch Application Chart A							
	Overdrive Band	Intermediate Band	Reverse Band	Intermediate Clutch	Forward Clutch	Direct Clutch	Coast Clutch
Park							
Reverse			A	A		A	
Neutral							
1st					A		
2nd	A				A		
3rd				A	A		
4th				ANE	A	A	A
5th	A				A	A	
1st a			A		A		A
2nd a	A		A		A		A
3rd a		A		A	A		A
4th a				ANE	A	A	A
Manual 3rd		A		A	A		A
Manual 2nd	A		A		A		
Manual 1st			A		A		A

A=Applied
ANE=Applied but Not Effected

5R55N
Sprag Application

Sprag and One Way Clutch Application Chart							
	Input One-Way Clutch		Low One-Way Clutch		Intermediate One-Way Clutch		Engine Braking
	Drive	Coast	Drive	Coast	Drive	Coast	
Park							
Reverse	H	OR	NE		ORI		YES
Neutral							
1st	H	OR	H	OR	NE		NO
2nd	OR	OR	H	OR	NE		NO
3rd	H	OR	OR	OR	H		NO
4th	H	OR	OR	OR	OR		NO
5th	OR	OR	OR	OR	OR		YES
1st a	H	OR	H	OR	NE		YES
2nd a	OR	OR	H	OR	NE		YES
3rd a	H	OR	OR	OR	H		YES
Manual 3rd	H	OR	OR	OR	H		YES
Manual 2nd	OR	OR	H	OR	NE		YES
Manual 1st	H	OR	H	OR	NE		YES

5R55N
Pressure Specification

Line Pressure Chart						
Transmission	Vehicle Application	Range	Idle EPC	WOT Stall EPC	Idle Line	WOT Stall Line
5R55N	Lincoln LS 3.0L	P/N R D5/D4 M5/M4 M3 M2/M1	5 70-90 0-15 0-15 0-15 0-15	5 112-134 112-134 112-134 112-134 112-134	125-165 110-150 110-150 76-116 110-150 92-132	| 290-360 210-260 210-260 210-260 210-260
5R55N	Lincoln LS 3.9L	P/N R D5/D4 M5/M4 M3/M2/M1	5 70-90 0-15 0-15 0-15	5 112-134 112-134 112-134 112-134	125-165 92-132 110-150 110-150 110-150	| 290-360 210-260 210-260 210-260

5R55N
Pressure Specification

Alternate Main Line Tap

Line Pressure Chart						
Transmission	Vehicle Application	Range	Idle EPC	WOT Stall EPC	Idle Line	WOT Stall Line
5R55N	Lincoln LS 3.0L	P/N	5	5	125-165	|
		R	70-90	112-134	110-150	290-360
		D5/D4	0-15	112-134	110-150	210-260
		M5/M4	0-15	112-134	76-116	210-260
		M3	0-15	112-134	110-150	210-260
		M2/M1	0-15	112-134	92-132	210-260
5R55N	Lincoln LS 3.9L	P/N	5	5	125-165	|
		R	70-90	112-134	92-132	290-360
		D5/D4	0-15	112-134	110-150	210-260
		M5/M4	0-15	112-134	110-150	210-260
		M3/M2/M1	0-15	112-134	110-150	210-260

5R55N
Soleniod Application Chart

Solenoid Operation Chart								
Base Gearshift Selector Position	Powertrain Control Module (PCM) Commanded Gear	5R55N Solenoid States						
		SSA	SSB	SSC	SSD	PCA	PCB	PCC
P/N	P	ON	OFF	OFF	ON	L1	C2	L
R	R	ON	OFF	OFF	ON	L	H3	H
D5	1 2 3 4 5	ON ON ON OFF OFF	OFF OFF ON OFF OFF	OFF ON OFF OFF ON	ON ON ON ON ON	C L C C C	L C L L C	L L L H H
D4	1 2 3 4	ON ON ON OFF	OFF OFF ON OFF	OFF ON OFF OFF	ON ON ON OFF	C L C C	L C L C	L L L H
3	3	ON	ON	OFF	OFF	C	C	L
2	2	ON	OFF	ON	OFF	C	C	L
1	1	ON	OFF	OFF	OFF	C	C	L

*** Failsafe for this unit is Fourth, Second and Reverse**

5R55N
Solenoid Failure Chart

SSA ALWAYS "OFF"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	3	3
2	2	2
3	3	3
4	4	4
5	5	

1=Manual

SSB ALWAYS "OFF"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	1	1
4	4	4M
5	5	

1=Manual

SSC ALWAYS "OFF"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	1	1
3	3	3
4	4	4
5	4	

1=Manual

SSD ALWAYS "OFF"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1/1M	1/1M
2	2M	2M
3	3/3M	3M
4	4/4M	4M
5	5	

1=Manual

5R55N
Solenoid Failure Chart

SSA ALWAYS "ON"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	3	3
4	1	1M
5	2	

1=Manual

SSB ALWAYS "ON"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	3	3
2	2	2
3	3	3
4	4	4M
5	5	

1=Manual

5R55N

Pressure Control Solenoid Failure

PC A "HIGH"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	3	3
4	4	4M
5	5	

1=Manual

PC B "HIGH"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	3	3
4	4	4M
5	5	

1=Manual

PC B "LOW"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	1	1
3	3	3
4	3	4
5	3	

5R55N

Pressure Control Solenoid Failure

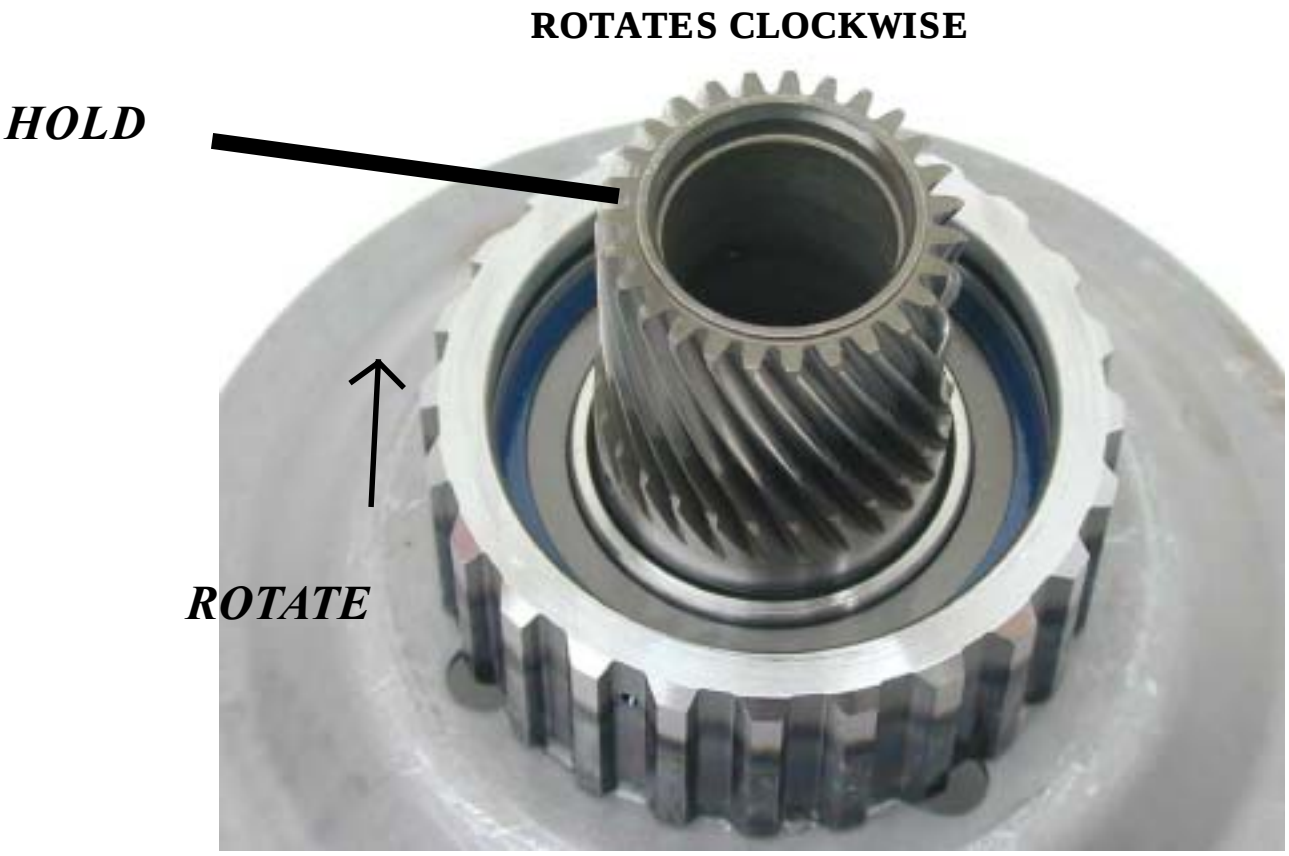
PC C "LOW"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	3	3
4	3	3
5	1.1	

PC B "HIGH"	Transmission Range Selector Lever Position	
	D5	D4
PCM Gear Commanded	Actual Gear Obtained	
1	1	1
2	2	2
3	3	3
4	4	4M
5	5	

1=Manual

5R55N
Intermediate Sprag Rotation

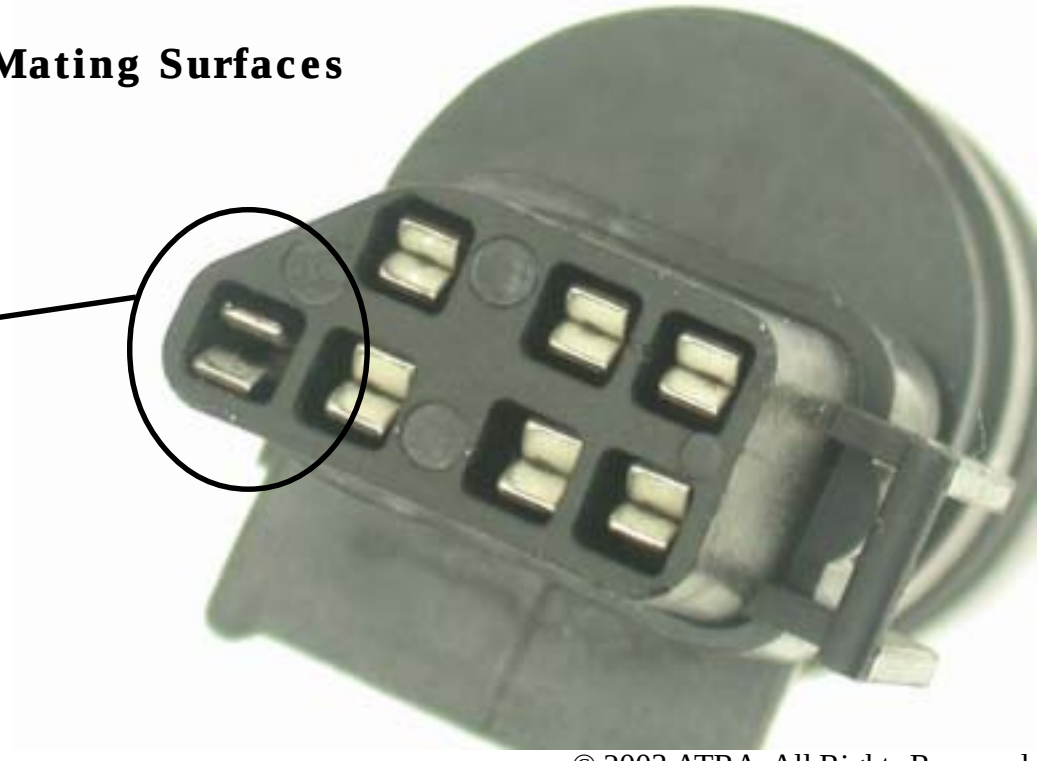
A damaged intermediate sprag will cause a bind in third and fourth or no third or fourth condition.



4R70W
Solenoid Codes P0750, P0751, etc. and/or Erratic Shifting

Intermittent TCIL flashing may be caused by the internal solenoid hard shell harness being distroted or not being fully seated between the solenoid and the harness.

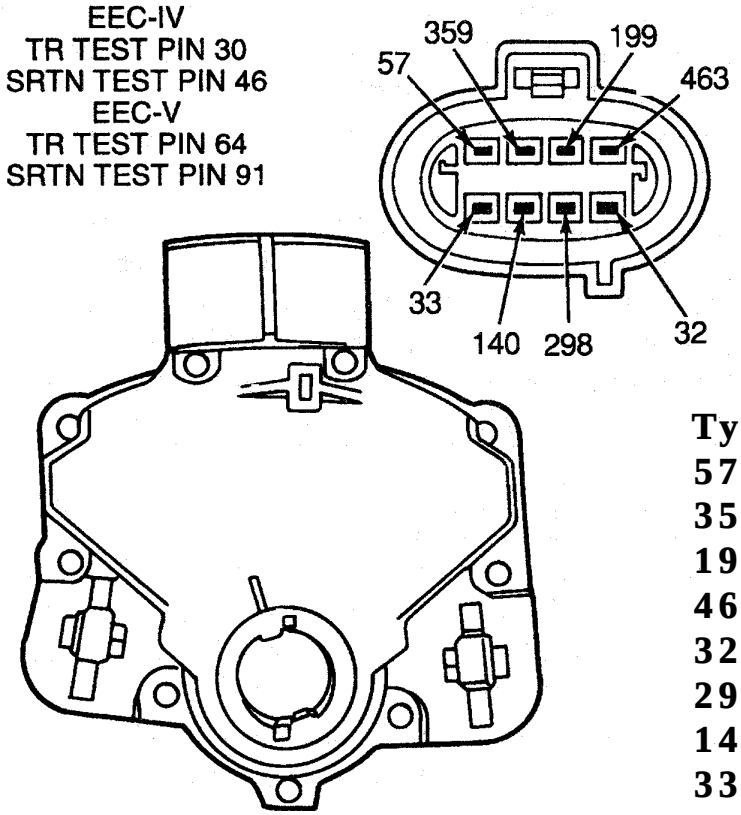
Check the Mating Surfaces



4R70W
Downshifts at High Speeds

This problem is usually caused by the Manual Lever Position Sensor/Transmission Range Sensor voltage rising because of a bad ground or damaged MLP sensor making the PCM believe the transmission was manually downshifted. To verify this concern monitor the MLP/TR sensor on the scanner or at the sensor signal pin. If voltage changes during the drive or when road shock is applied make sure the concetions and wiring is good , then replace the sensor.

Diagnostic Trouble Codes: Two Digit -67, Three Digit 634, 654, 667, 668, Four Digit - P0705, P0707, P0708, P1705



Typical Pin Identification
57=Ground
359=Signal Return
199=MLP to PCM
463=Nuetral Sense (4X4)
32=Starter Circuit
298=Fused Accy Feed
140=Backup Lamp
33=Starter Circuit

4R70W
Downshifts at High Speeds

There are a few differances between the TransmissionRange sensor and the Manual Lever Position Sensor. The TR sensor refers to four pins at the PCM, where as the MLP refers only to one pin at the PCM.

Transmission Range Selector Level Position	Resistance (ohms)		Range Volts
	Min	Max	
P	3770	4607	3.97-4.85
R	1304	1593	3.24-3.96
N	660	807	2.55-3.11
D	361	442	1.88-2.30
2	190	232	1.23-1.51
1	78	95	0.61-0.75

Gear	TR4	TR3*	TR2	TR1
Park	0 volts	0 volts	0 volts	0 volts
Reverse	11.5 volts	1.7 volts	0 volts	0 volts
Neutral	0 volts	1.7 volts	11.5 volts	0 volts
Drive	11.5 volts	1.7 volts	11.5 volts	11.5 volts
M 2	11.5 volts	0 volts	0 volts	11.5 volts
M 1	0 volts	0 volts	11.5 volts	11.5 volts

*TR3 has 5 volts supplied to a 270 ohm resistor. If 5 volts is present at PCM pin 64 for TR3 then the circuit is open.

4R70W
Repeat Intermediate Diode Failure

Typically caused by flooding solenoids this problem can give you trouble if not diagnosed completely. The Diode sprag is considerably stronger then the older roller one-way clutches, however the cause is still the same. During a forced down shift from 4-2, SS1 and SS2 are commanded OFF. If the solenoids are worn or inoperative they don't exhaust properly causeing the solenoids to flood and hold the 3-4 valve in its 4th gear position (no Forward clutch fill). Because the PCM command for second gear happens the 2-3 shift valve is stroked to the 2nd gear position and the 3-4 shift valve is held up in the 4th gear position, this causes the feel of Nuetral, O/D Band applied, direct clutch applied, no intermediate, no forward. When this happens the customer or technician removes his/her foot from the accelerator the line pressure drops and the intermediate clutches catch. When this happens the Sprag is hammered and wear or breakage occurs.

4R100

2nd Gear slips or No 2nd

The common cause for this problem is duability of the Intermediate Diode sprag. A new drum and sprag assembly was introduced last year in ATRA Bulletin #642. When a replacemnet is necessary you may need to replace the piston and return spring also. The new Drum deletes the thrust washer assemly and has a smaller piston travel area.

Part #'s

E9TZ-7A089-B	Intermaediate sprag
1C3Z-7B164-BA	Clutch Plates
YC3Z-7D044-AA	4 Plate Drum 5.4L and 6.8L
YC3Z-7D044-BA	5 Plate Drum 7.3L only
F3TZ-7G401-AA	Thrust Washer#7

4R100

Intermediate Clutches Burnt

A common failure of the Intermediate clutch is almost always caused by lack of feed oil to the piston, typically due to case damage, one modification you can do is install a rubber gasket/seal around the feed hole of the Inermediate clutch drum. There are a few things your going to need to do before this repair.

Parts needed:
1 = PC 7/32" 16 mml oil resistant hose
1 = Razor Blade
1 = C6 Direct Clutch Return Spring

4R100
Intermediate Clutches Burnt

Seat hose at the bottom of the channel case

With hose extended through case, trim it with the razor blade.

Make sure it is flush against the case.

4R100

Intermediate Clutches Burnt

Cut specification

Spring specification

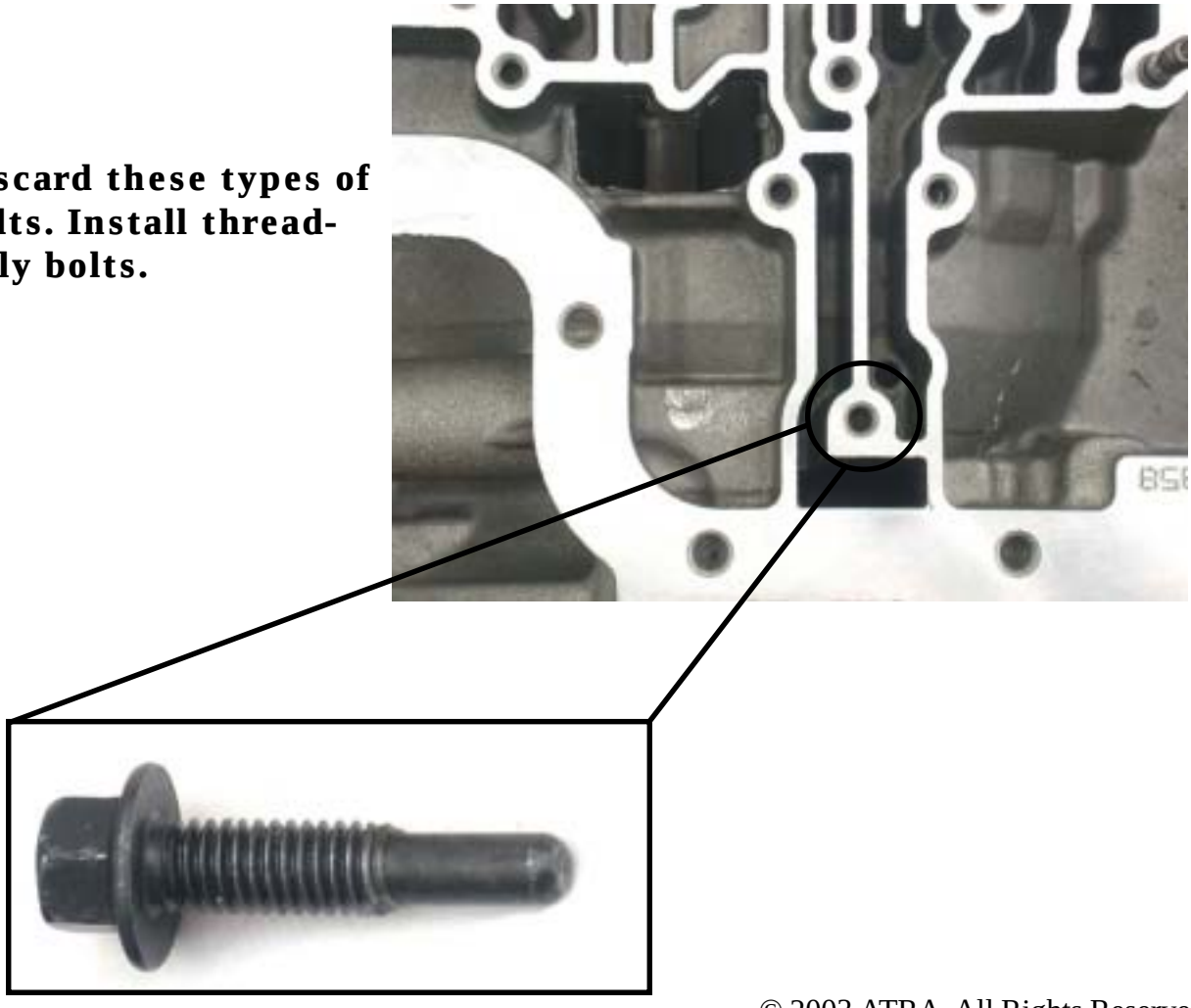
Should be less then a 1/8 of an inch above the seperator plate

4R100

No/Slipping Reverse, No/Slipping Manual Low

A No Reverse or Manual low condition can be caused by the Low/Reverse plate bolts being too long and bottoming out in the case. Signs of this are evident when initial inspection shows the tip of the bolt and the bottom of the case having signs of damage

Discard these types of bolts. Install thread-only bolts.



4R100

Vehicle Speed Sensor Input when Vehicle is Stationary

An erratic 1-2 upshift or 2-1 downshift may be caused by a VSS input while the vehicle is stationary. Monitor the VSS on you scanner, if the scanner shows a VSS signal with the KEY ON and the ENGINE OFF. It may be necessary to install a jumper kit from FORD. This kit replaces the computer's current ground wires with a single body ground cable.

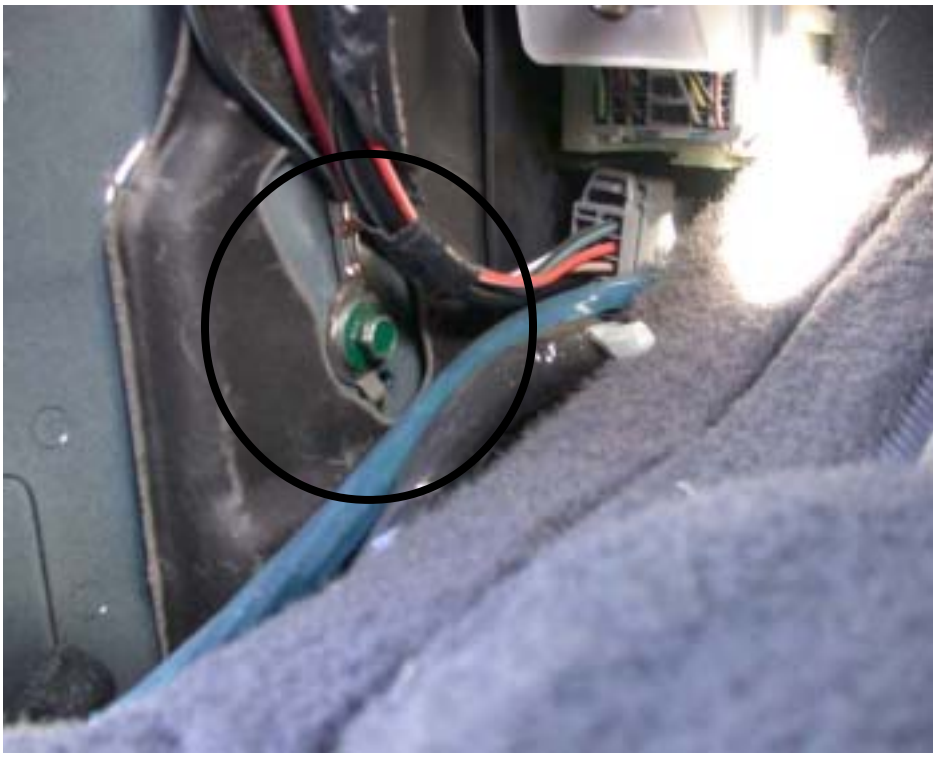
Part # 1C3Z-13N850-AA

4R100

Vehicle Speed Sensor Input when Vehicle is Stationary

To install the jumper kit:

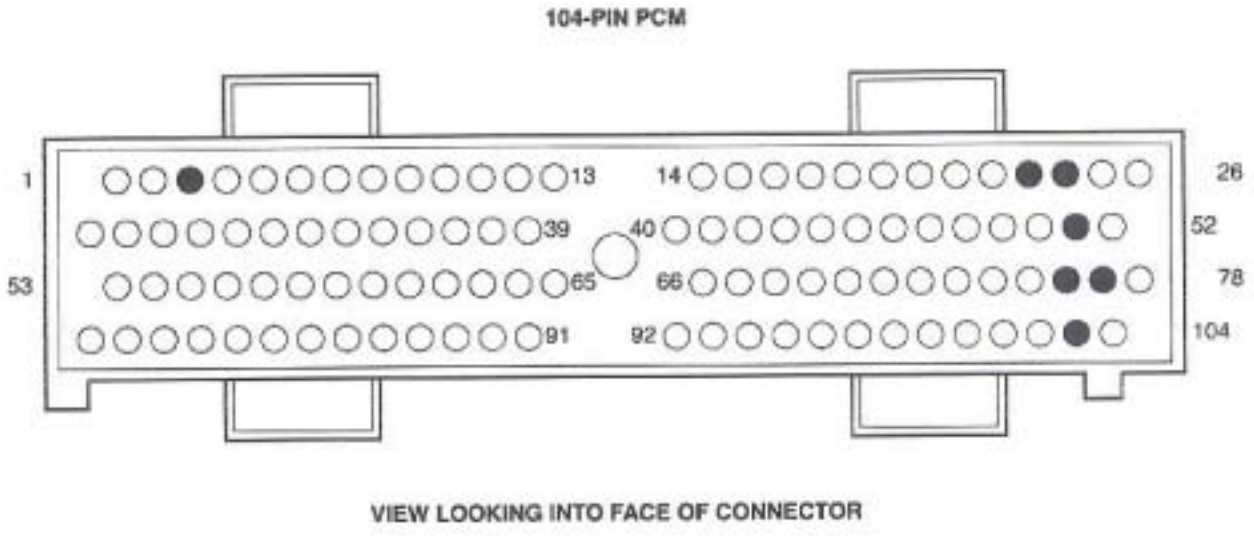
1. Disconnect the battery negitive cable.
2. Remove the ground screw from under the dash.
   (Left side of the brake pedel)
3. Drill a 6mm (1/4) hole near the original ground screw location and clean to bare metal. (**make sure you can attatch a nut behind the bolt**)
4. Using a new bolt and nut attatch the original ground eyelets to the sheet metel.



4R100

Vehicle Speed Sensor Input when Vehicle is Stationary

5. Remove the PCM connector and sheild.
6. Remove the RED locking plate from the front of the connector.
7. Remove the wires from pins 3, 23, 24, 51, 76, 77, 103.
8. Install the jumper kit to the PCM in the loctations that you removed in the previous step.
9. Reinstall all the neccessary componets and retest the system.



TorqShift 5R110W
Description

The transmission features include:
Â six speeds.
Â a fully automatic transmission.
Â direct electronic shift control.
Â optional power take-off.

The main operating components include:
Â a torque converter clutch.
Â six multiple-disc friction clutches.
Â two mechanical diode one-way clutches (OWC).
Â three planetary gear sets.

5R110W
Clutch Application Chart

Tow Haul OFF							
Range	Engine Braking	Forward Clutch	Coast Clutch	Overdrive Clutch	Interme-diate Clutch	Direct Clutch	Low/ Reverse
Park							A (a)
R			A			A (d)	A (a)
N							A (a) (c)
O/D 1		A				A (a) (c)	
O/D 2		A		A			
O/D 3		A			A		
O/D 4 (b)	YES	A		A	A		
O/D 5		A				A	
O/D 6	YES	A		A		A	

Gear Ratio	
1st	3.09-1
2nd	2.2-1
3rd	1.538-1
4th	1.096-1
5th	1
6th	0.712-1
Reverse	2.88-1

(a) Commanded pressures viewed on scanner

(c) 30 psi until 3 mph

(d) Clutch applied through the manual valve

5R110W
Clutch Application Chart

Tow Haul ON							
Range	Engine Braking	Forward Clutch	Coast Clutch	Overdrive Clutch	Interme-diate Clutch	Direct Clutch	Low/ Reverse
Park							A (a) (c)
R			A			A(d)	A (a)
N							A (a) (c)
O/D 1	YES	A	A				A (a)
O/D 2	YES	A		A			A (a)
O/D 3	YES	A	A		A		
O/D 4	YES	A		A	A		
O/D 5	YES	A	A			A	
O/D 6	YES	A		A		A	

Manual Position							
Range	Engine Braking	Forward Clutch	Coast Clutch	Overdri-ve Clutch	Interme-diate Clutch	Direct Clutch	Low/ Reverse
P							A (a) (c)
R			A			A (d)	A (a)
N							A (a) (c)
M1	YES	A	A				
M2	YES	A		A			A
M3	YES	A	A		A		A

5R110W
Pressure Specification

Pressure can be measured at the main line tap on the drivers side of the transmisison. All of the other pressures are going to be monitered using your scanner.

Gear	Idle Speed	WOT Stall	kPa	psi
P, N	344 (50)	—	172 (25)	—
R	689 (100)	2,206 (320)	413 (60)	1,407 (204)
(D)	483 (70)	2,206 (320)	276 (40)	1,379 (200)
3	551 (80)	1,793 (260)	331 (48)	1,172 (170)
2	551 (80)	1,482 (215)	338 (49)	952 (138)
1	551 (80)	1,861 (270)	338 (49)	1,213 (176)

(a) = commanded pressure as viewed on diagnostic equipment.

Pressure Chart C

NOTE: Actual and Commanded pressures will vary based on calibration and transmission adaptive strategies. All pressures listed are approximate.

	Commanded (a) — SSPC-C pressure kPa (psi)		Commanded (a) — SSPC-D pressure kPa (psi)	
Gear	Idle Speed	WOT Stall	Idle Speed	WOT Stall
P, N	0	—	0	—
R	0	0	0 (b)	0 (b)
(D)	0	0	0	0
3	572 (83)	1,765 (256)	0	0
2	0	0	0	0
1	0	0	0	0

Pressure Chart D

NOTE: Actual and Commanded pressures will vary based on calibration and transmission adaptive strategies. All pressures listed are approximate.

	Commanded (a) — SSPC-E pressure kPa (psi)	
Gear	Idle Speed	WOT Stall
P, N	207 (30)	—
R	758 (110)	0
(D)	207 (30)	0
3	0	0
2	586 (85)	1,461 (212)
1	572 (83)	1,765 (256)

(a) = commanded pressure as viewed on diagnostic equipment.

5R110W
Pressure Specification

Pressure Chart B

NOTE: Actual and Commanded pressures will vary based on calibration and transmission adaptive strategies. All pressures listed are approximate.

Gear	Commanded (a) — SSPC-A pressure kPa (psi)		Commanded (a) — SSPC-B pressure kPa (psi)	
	Idle Speed	WOT Stall	Idle Speed	WOT Stall
P, N	0	—	0	—
R	758 (110)	2,068 (300)	0	0
(D)	0	0	0	0
3	572 (83)	1,765 (256)	0	0
2	0	0	586 (85)	1,461 (212)
1	572 (83)	1,765 (256)	0	0

(a) = commanded pressure as viewed on diagnostic equipment.

Shift Speeds

NOTE: All shift speeds are for normal mode, not with tow/haul on.

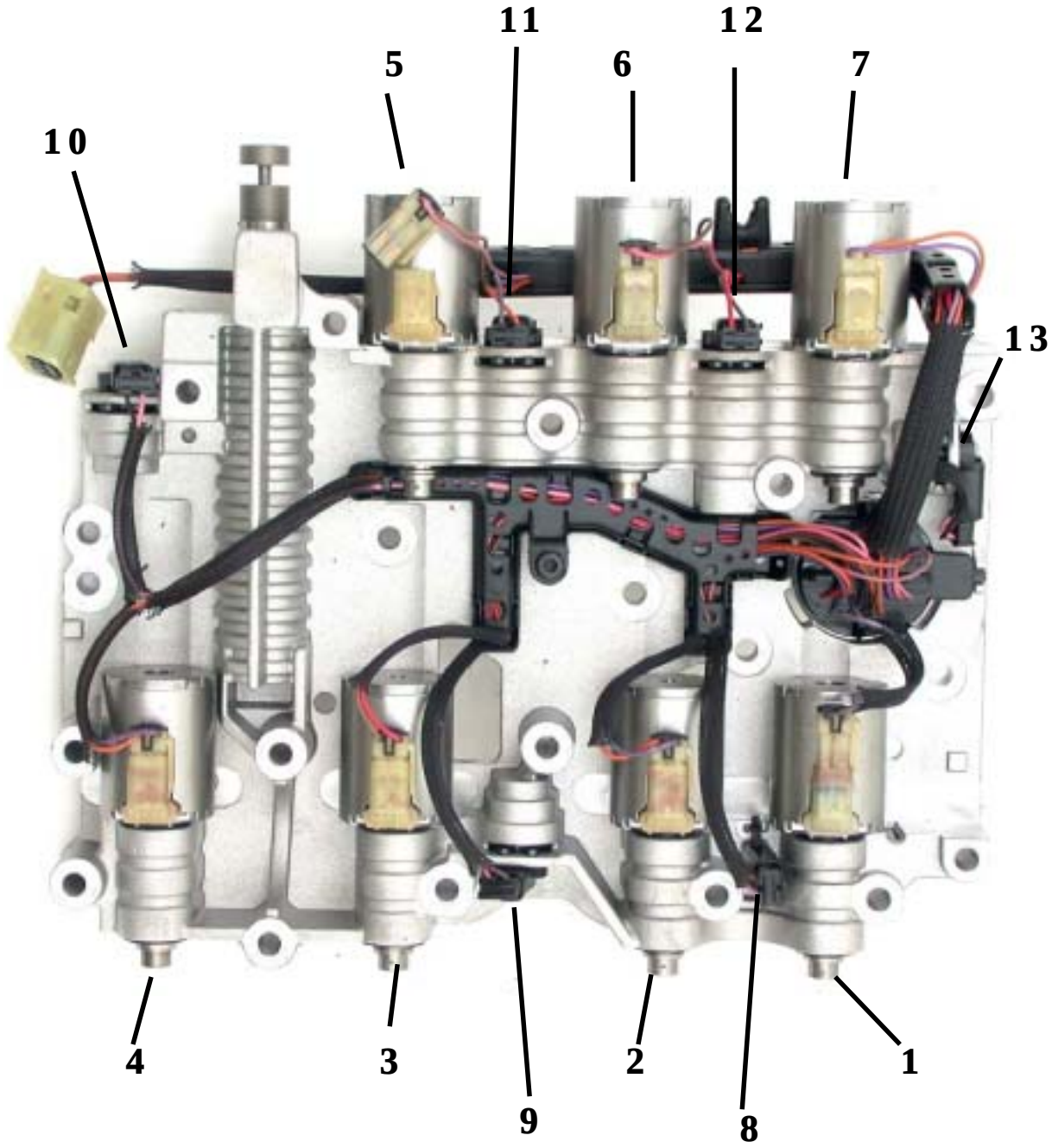
Throttle Position	(D)Position Shift	Speed Tow/Haul OFF MPH	Speed Tow/Haul OFF Km/H	Speed Tow/Haul ON MPH	Speed Tow/Haul ON Km/H
Closed	6-5	21-28	34-45	40-53	64-85
	5-3	14-20	23-32	26-35	41-56
	3-2	—	—	18-24	29-39
	3-1	6-9	10-14	—	—
	2-1	—	—	8-11	13-18
Minimum Throttle TP Voltage 1.25 Volts	1-2	8-11	13-18	14-19	23-31
	2-3	12-16	19-26	19-26	31-42
	3-4 (a)	16-21	26-34	16-21	26-34
	3-5	16-21	26-34	28-37	45-60
	4-6 (a)	24-32	39-51	41-54	66-87
	5-6	24-32	39-51	44-58	71-93
Wide Open	1-2	20-28	32-45	20-27	32-43
	2-3	29-39	47-63	28-38	47-61
	3-4 (a)	41-55	66-89	41-55	66-89
	3-5	41-55	66-89	41-55	66-89
	4-6 (a)	61-81	98-130	62-81	100-130
	5-6	66-87	106-140	66-88	106-142

(a) indicates cold strategy

5R110W
Solenoid Specification Chart

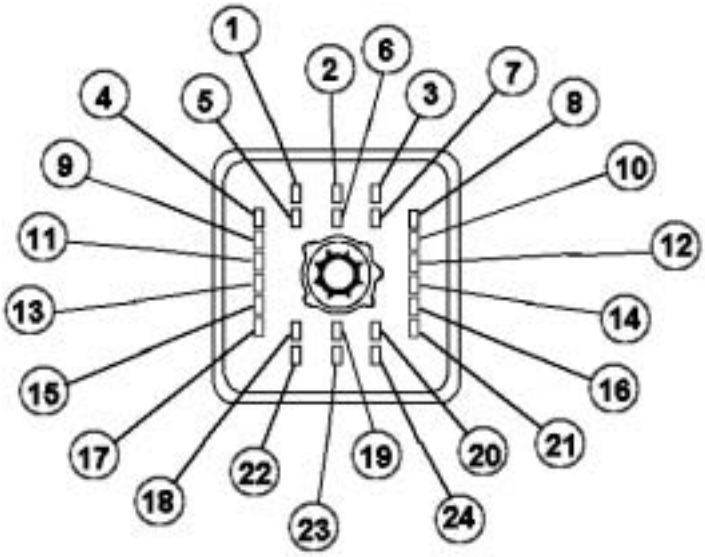
1	**PC-A**	**4.7 ohms +/- (line pressure)**
2	**TCC**	**4.7 ohms +/- (torque converter clutch)**
3	**SSPC-B**	**4.7 ohms +/- (overdrive)**
4	**SSPC-A**	**4.7 ohms +/- (coast clutch)**
5	**SSPC-E**	**4.7 ohms +/- (low/reverse clutch)**
6	**SSPC-D**	**4.7 ohms+/- (direct clutch)**
7	**SSPC-C**	**4.7 ohms +/- (intermedate clutch)**
8	**TFT**	**200K ohm scale (transmission fluid temperature)**
9	**PS-B**	**0.5 ohm +/- (overdrive pressure switch)**
10	**PS-A**	**0.5 ohm +/- (coast clutch pressure switch)**
11	**PS-E**	**0.5 ohm +/- (low/reverse pressure switch)**
12	**PS-D**	**0.5 ohm +/- (direct clutch pressure switch)**
13	**PS-C**	**0.5 ohm +/- (intermediate clutch pressure switch)**
14	**TR-P**	**(transmission range sensor) not shown here**

5R110W
Solenoid Specification Chart



5R110W

Valve Body Wiring



Connector shown from the valve body connector side

5R110W
Valve Body Wiring

+Pin Number	Description	PCM Connector	Int. Wire Color Pin No. 1	Int. Wire Color Pin No. 2	Int. Wire Color Pin No. 3
1	SSPC-E	13	Light Green	Gray	—
2	Not Used	—	—	—	—
3	SSPC-B	10	Red	Light Green	—
4	SSPC-D	12	Brown	Pink	—
5	SSPC-C	11	Yellow	Purple	—
6	Not Used	—	—	—	—
7	Solenoid VPWR (a)	7	—	—	—
8	TCC	14	Dark Blue	Orange	—
9	PS-C	19	White	Black	—
10	PC-A	17	Light Blue	White	—
11	PS-D	20	Red	Dark Green	—
12	SSPC-A	9	Purple	Yellow	—
13	PS-E	21	Dark Blue	Orange	—
14	PS-A	17	Black	White	—
15	TR-P Signal	25	—	Light Blue	—
16	PS-B	18	Brown	Pink	—
17	TR-P Ground	22	—	—	Tan
18	TFT Signal	26	Tan	Gray	—
19	Not Used	—	—	—	—
20	Solenoid VPWR (a)	7	—	—	—
21	VPWR for TR-P Sensor only	1	Orange	—	—
22	SGNRTN (b)	30	—	—	—
23	Not Used	—	—	—	—
24	VPWR (a)	7	—	—	—
(a) See negative pins for SSPC-x.					
(b) See negative pins for PS-x.					

Mazda to Ford Conversion

Sometimes, you won't be able to scan Mazda vehicles with the 4R/5R series transmissions using Mazda ID from the VIN. If you run into this, enter your scan tool data as if you were working on a Ford vehicle. This chart will help you with the conversion.

Conversion Mazda I.D. to Ford I.D.									
Mazda VINs			Year	Model	Disp	Ford VINs			
10th	4th	8th				10th	2nd	5th	8th
M	C	X	91	Navajo	4.0L	M	F	U	X
N	C	X	92	Navajo	4.0L	N	F	U	X
P	C	X	93	Navajo	4.0L	P	F	U	X
R	C	X	94	Navajo	4.0L	R	F	U	X
R	C/D	A	94	B2300	2.3L	R	F	R	A
R	C/D	U	94	B3000	3.0L	R	F	R	U
R	C/D	X	94	B4000	4.0L	R	F	R	X
R	G	C	94	626/MX6	2.0L	R	Z	T	A
S	G	C	95	626/MX6	2.0L	S	Z	T	A
S	C/D	A	95	B2300	2.3L	S	F	R	A
S	C/D	U	95	B3000	3.0L	S	F	R	U
S	C/D	X	95	B4000	4.0L	S	F	R	X
T	C/D	A	96	B2300	2.3L	T	F	R	A
T	C/D	U	96	B3000	3.0L	T	F	R	U
T	C/D	X	96	B4000	4.0L	T	F	R	X
V	C/D	A	97	B2300	2.3L	V	F	R	A
V	C/D	U	97	B3000	3.0L	V	F	R	U
V	C/D	X	97	B4000	4.0L	V	F	R	X
W	C/Y	C	98	B2500	2.5L	W	F	R	C
W	C/Y/Z	U	98	B3000	3.0L	W	F	R	U
W	C/Y/Z	X	98	B4000	4.0L	W	F	R	X
X	C/Y	C	99	B2500	2.5L	X	F	R	C
X	C	U	99	B3000	3.0	X	F	R	U
X	Y/Z	V	99	B3000	3.0L FF	X	F	R	V
X	C/D/Y/Z	X	99	B4000	4.0L	X	F	R	X
Y	C/Y	C	00	B2500	2.5L	Y	F	R	C
Y	C/Y/Z	U	00	B3000	3.0L	Y	F	R	U
Y	Y	V	00	B3000	3.0L FF	Y	F	R	V
Y	C/Y/Z	X	00	B4000	4.0L	Y	F	R	X
1	Y	C	01	B2300	2.3L	1	F	R	C
1	Y	D	01	B2500	2.5L	1	F	R	D
1	Y/Z	U	01	B3000	3.0L	1	F	R	U
1	Y/Z	E	01	B4000	4.0L	1	F	R	E

NOTES:

NOTES: