



CHECKBALL BOOK

Domestic Volume I

INDEX

CHRYSLER CORP.

A904/727, A500/518, 42RE/47RE	34
A404/413/670, 31TH	36
A604 (41TE)	37
A606 (42LE)	40
45RFE	114

FORD MOTOR COMPANY

FMX	41
C-3	42
C-4	44
C-5	46
C-6	48
A4LD	49
4R44E/55E, 5R44E/55E	53
AOD	54
AODE/4R70W	55
E4OD (Valve Body)	57
E4OD (Case)	62
4R100 (Valve Body)	58
4R100 (Case)	63
ATX	64
AXOD	68
AXODE (AX4S)	72
AX4N (4F50N)	77
5R55N	112
5R55W	113
4F20E	118

GENERAL MOTORS CORP.

125C	4
180C	5
200C	6
200-4R	7
325	9
325-4L	10
350C	12
400	13
425	15
440-T4	16
700-R4	20
4L60-E	22
4L80-E	24
4T40-E	26
4T60-E	27
4T65-E	116
4T80-E	29
4/5L40-E	115
Saturn (TAAT)	32

IMPORT TRANSMISSIONS FOUND IN DOMESTIC VEHICLES

CHRYSLER CORP.

KM 170, 171, 172	107
KM 175, F4A21, 22, 23, 33	110
JM600 (4N71B)	87

FORD MOTOR COMPANY

F3A	80
3N71B	86
G4A-HL	89
G4A-EL	94
GF4A-EL	99
F4EAT	105

GENERAL MOTORS CORP.

F3A	80
MX-17	82
A130/A131	84



Updated
January, 2003

INTRODUCTION

CHECKBALL BOOK DOMESTIC

This "Checkball Manual" will show you the checkball locations in the case and valve body of transmissions manufactured from 1980 up through 2003. We have covered the updates that have occurred in similar model transmissions, where checkball locations may have changed. This manual covers most transmissions manufactured by Chrysler Corporation, Ford Motor Company and General Motors Corporation. We also have included some Import transmissions that are found in Domestic vehicles.

No part of any ATSG publication may be reproduced, stored in any retrieval system or transmitted in any form or by any means, including but not limited to electronic, mechanical, photocopying, recording or otherwise, without **written** permission of Automatic Transmission Service Group. This includes all text illustrations, tables and charts.

"Portions of materials contained herein have been reprinted under license from General Motors Corp, Service & Parts Operations."

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

Copyright © ATSG 2002

DALE ENGLAND
FIELD SERVICE CONSULTANT

WAYNE COLONNA
TECHNICAL SUPERVISOR

PETER LUBAN
TECHNICAL CONSULTANT

JON GLATSTEIN
TECHNICAL CONSULTANT

ROLAND ALVAREZ
TECHNICAL CONSULTANT

GERALD CAMPBELL
TECHNICAL CONSULTANT

JIM DIAL
TECHNICAL CONSULTANT

ED KRUSE
TECHNICAL CONSULTANT

GREGORY LIPNICK
TECHNICAL CONSULTANT

DAVID CHALKER
TECHNICAL CONSULTANT

JERRY GOTT
TECHNICAL CONSULTANT

MIKE SOUZA
TECHNICAL CONSULTANT

AUTOMATIC TRANSMISSION SERVICE GROUP
18639 SW 107TH AVENUE
MIAMI, FLORIDA 33157
(305) 670-4161



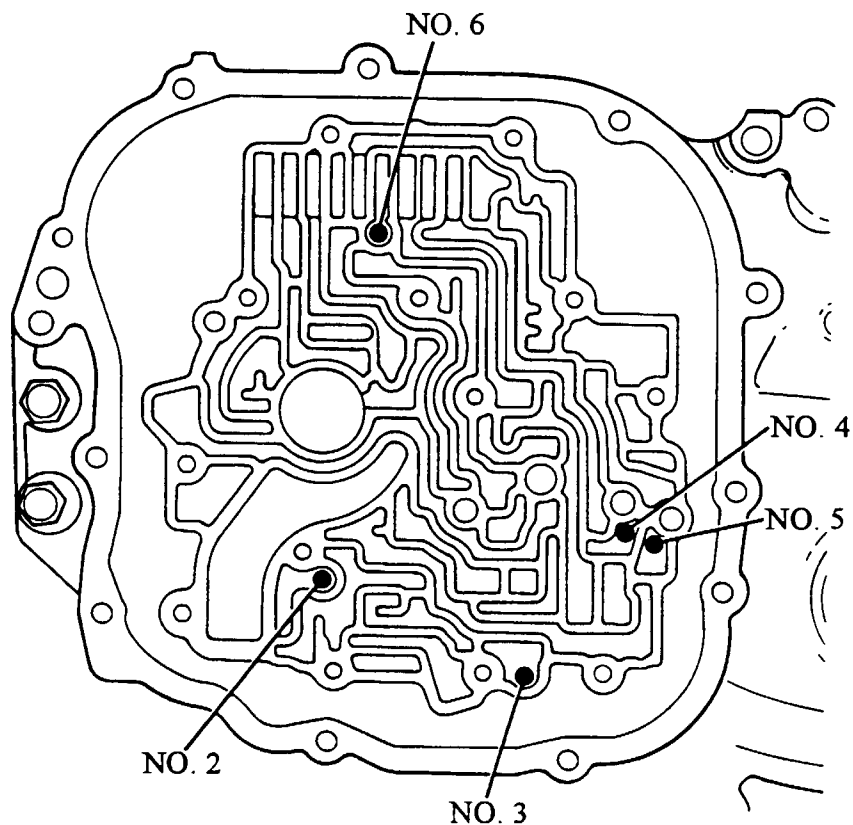
CHECK BOOK DOMESTIC

NOTES

AUTOMATIC TRANSMISSION SERVICE GROUP

THM 125C

VALVE BODY & MAIN CASE CHECKBALL LOCATIONS



- NO. 1 DIRECT CLUTCH EXHAUST
- NO. 2 DIRECT CLUTCH ACCUMULATOR
- NO. 3 LO 1ST CHECKBALL
- NO. 4 LO AND REVERSE CHECKBALL
- NO. 5 DIRECT AND REVERSE CLUTCH
- NO. 6 RNDI AND DETENT CHECKBALL

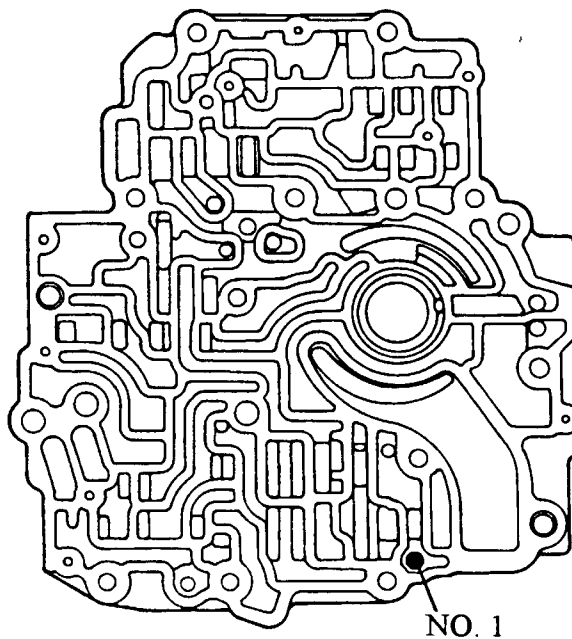
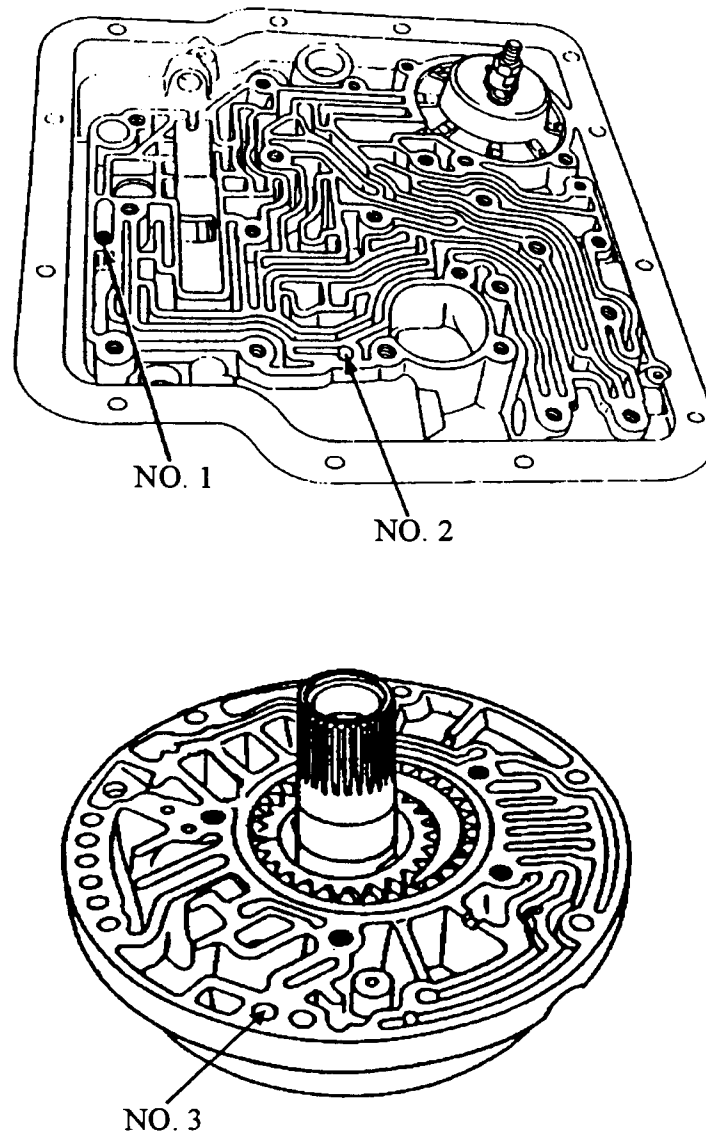


Figure 1

THM 180C

PUMP & MAIN CASE CHECKBALL LOCATIONS



NO. 1 LOW/REVERSE BOOST SHUTTLE BALL

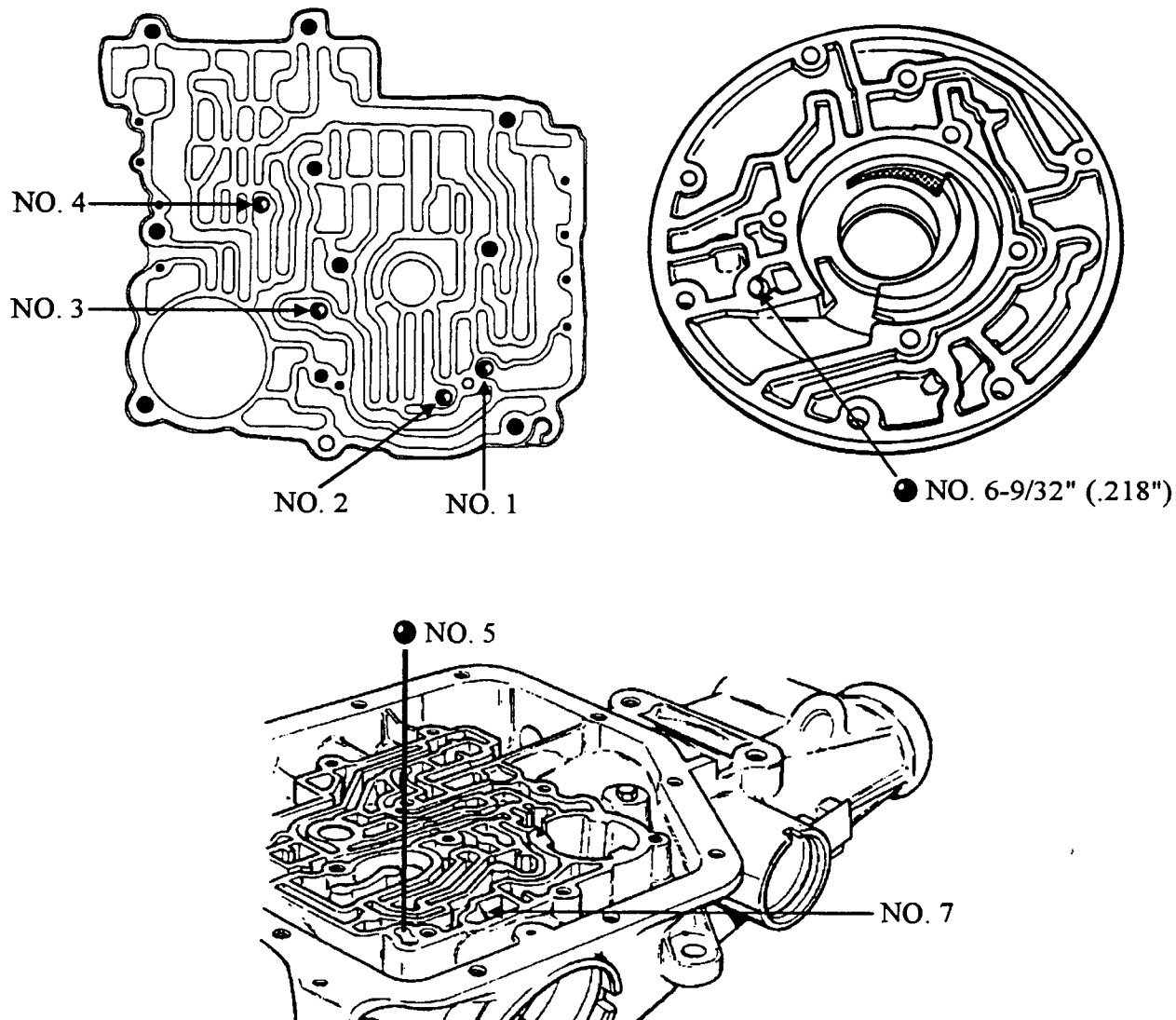
NO. 2 2ND GEAR ORIFICE BALL (On later models with 1759 or 2279 cm³ engines with H4 and L1 calibration respectively, the 2nd clutch orifice ball was deleted and a revised transfer plate installed)

NO. 3 REVERSE ORIFICE CONTROL BALL (Not used in most models)
(Can cause delayed engagements into reverse, take ball out and leave the capsule in)

Figure 2

THM 200C

PUMP, VALVE BODY & MAIN CASE CHECKBALL LOCATIONS



NO. 1 SHIFT T.V. & REVERSE BOOST SHUTTLE BALL

NO. 2 DIRECT CLUTCH ACCUMULATOR EX. BALL

NO. 3 INTERMEDIATE REVERSE BOOST SHUTTLE BALL

NO. 4 DIRECT CLUTCH EXHAUST BALL

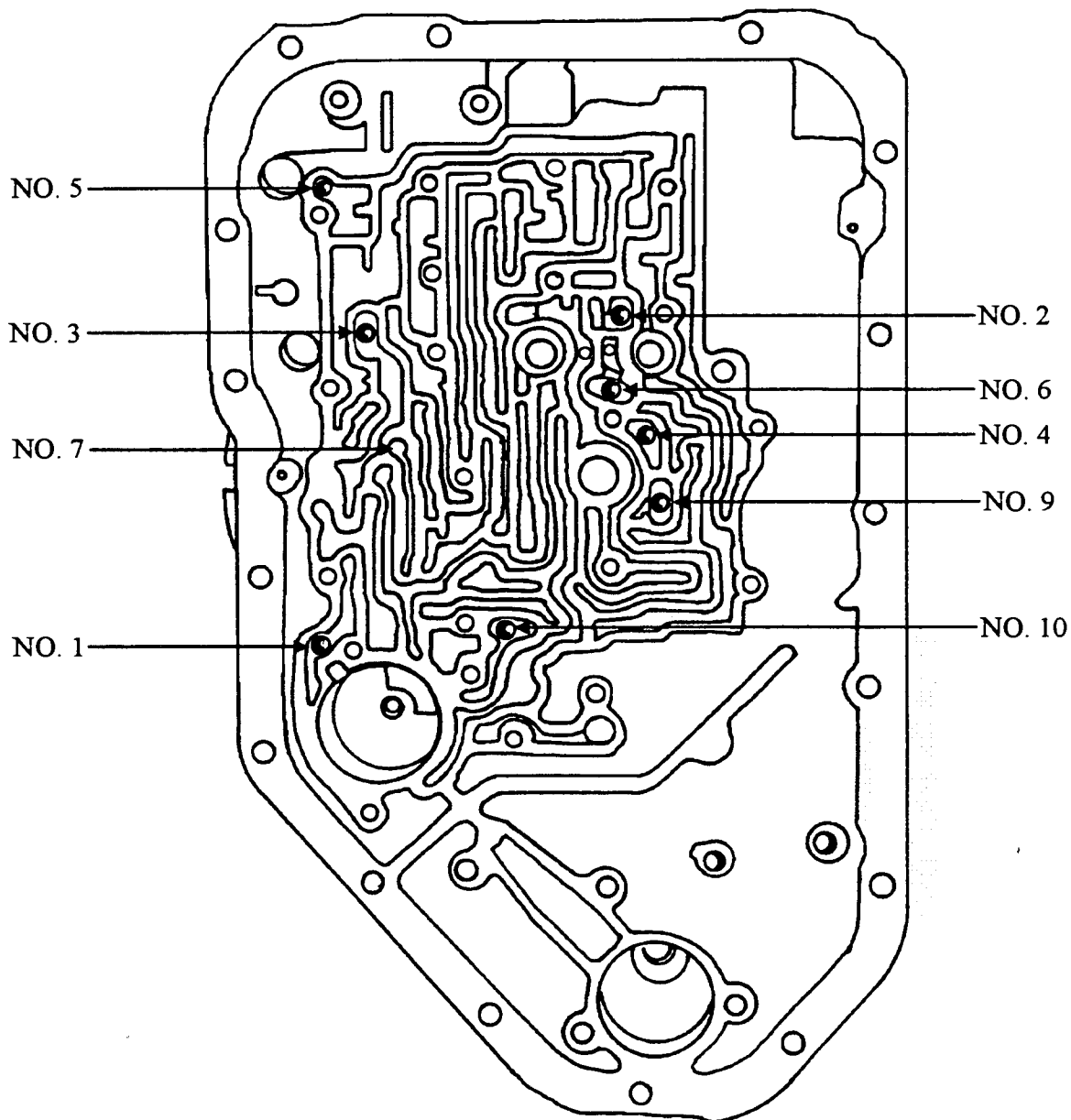
NO. 5 T.V. EXHAUST LIFTER BALL

NO. 6 3RD & REVERSE SHUTTLE BALL

NO. 7 3RD ACCUMULATOR & 3-2 EXHAUST CAPSULE - 8630570

Figure 3

THM 200-4R MAIN CASE CHECKBALL LOCATIONS

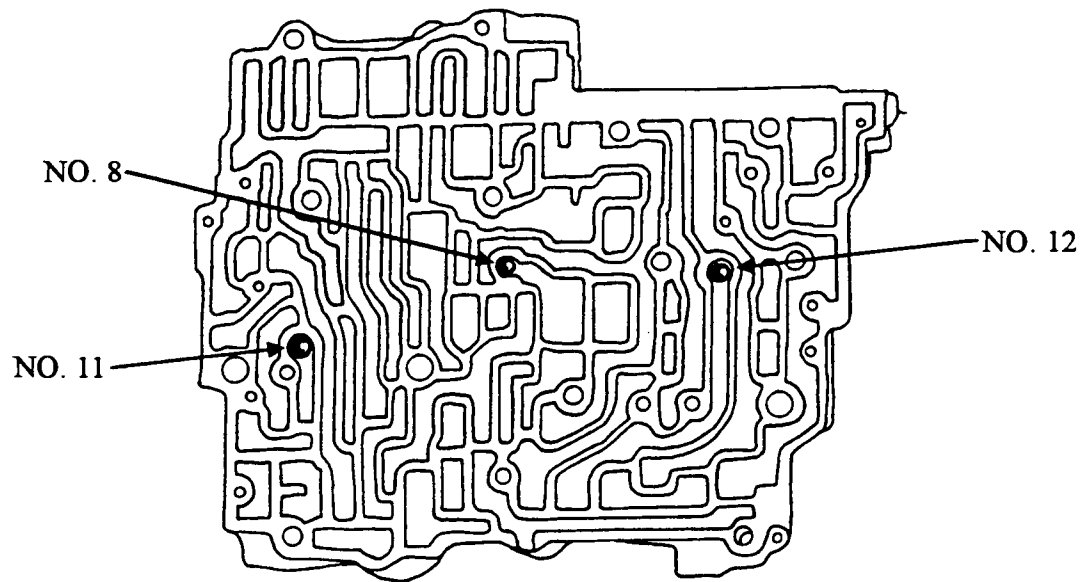


- NO. 1 FOURTH ACCUMULATOR
- NO. 2 THIRD CLUTCH ACCUMULATOR
- NO. 3 PART THROTTLE & DRIVE 3
- NO. 4 3-2 EXHAUST
- NO. 5 T.V. EXHAUST
- NO. 6 THIRD & REVERSE SHUTTLE BALL
- NO. 7 THIRD CLUTCH ACCUMULATOR & EXHAUST BALL
(located in a capsule inside the case - 8634400)
- NO. 9 LO/DETENT
- NO. 10 LO/ REVERSE

Figure 4

THM 200-4R

VALVE BODY CHECKBALL LOCATIONS



NO. 8 1-2 SHIFT CHECKBALL

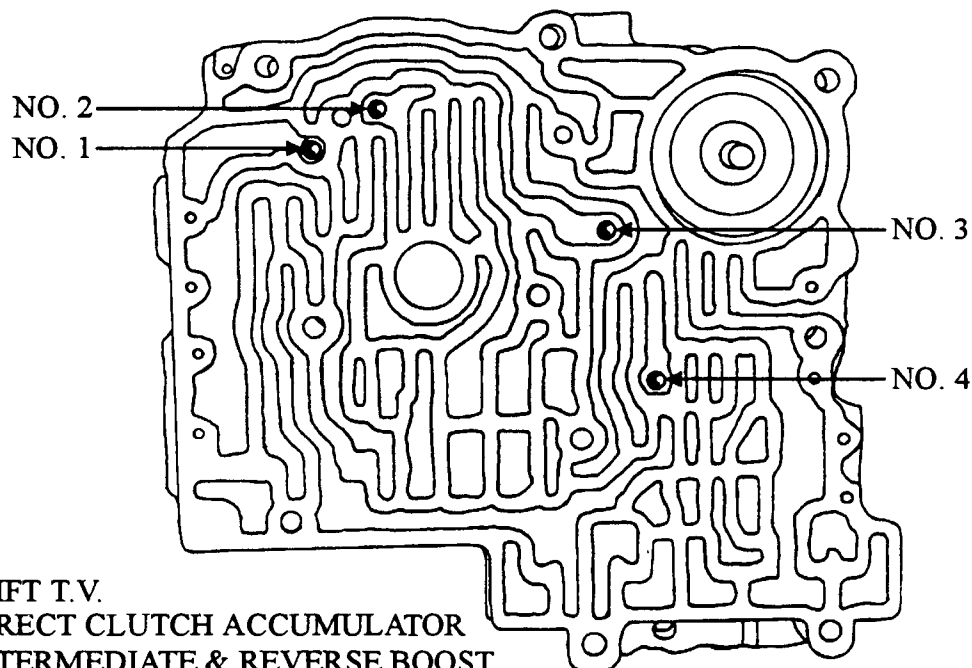
NO. 11 DRIVE 3 (D3) CHECKBALL

NO. 12 LO/1ST CHECKBALL

Figure 5

THM 325

VALVE BODY & MAIN CASE CHECKBALL LOCATIONS



- NO. 1 SHIFT T.V.
- NO. 2 DIRECT CLUTCH ACCUMULATOR
- NO. 3 INTERMEDIATE & REVERSE BOOST
- NO. 4 DIRECT CLUTCH EXHAUST
- NO. 5 T.V. EXHAUST
- NO. 6 DIRECT & REVERSE CLUTCH SHUTTLE BALL

NOTE: The #7 Direct Clutch Accumulator Exhaust is located in the case cover.
(See 325-4L for Check Ball location)

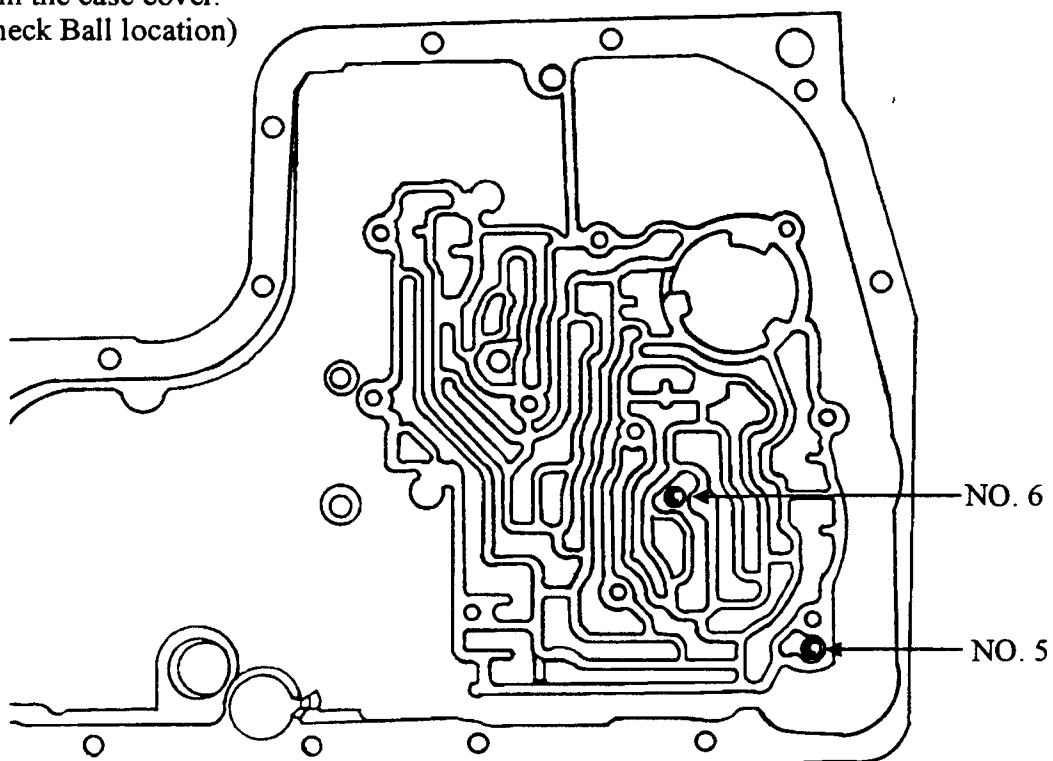


Figure 6

THM 325-4L
MAIN CASE CHECKBALL LOCATIONS

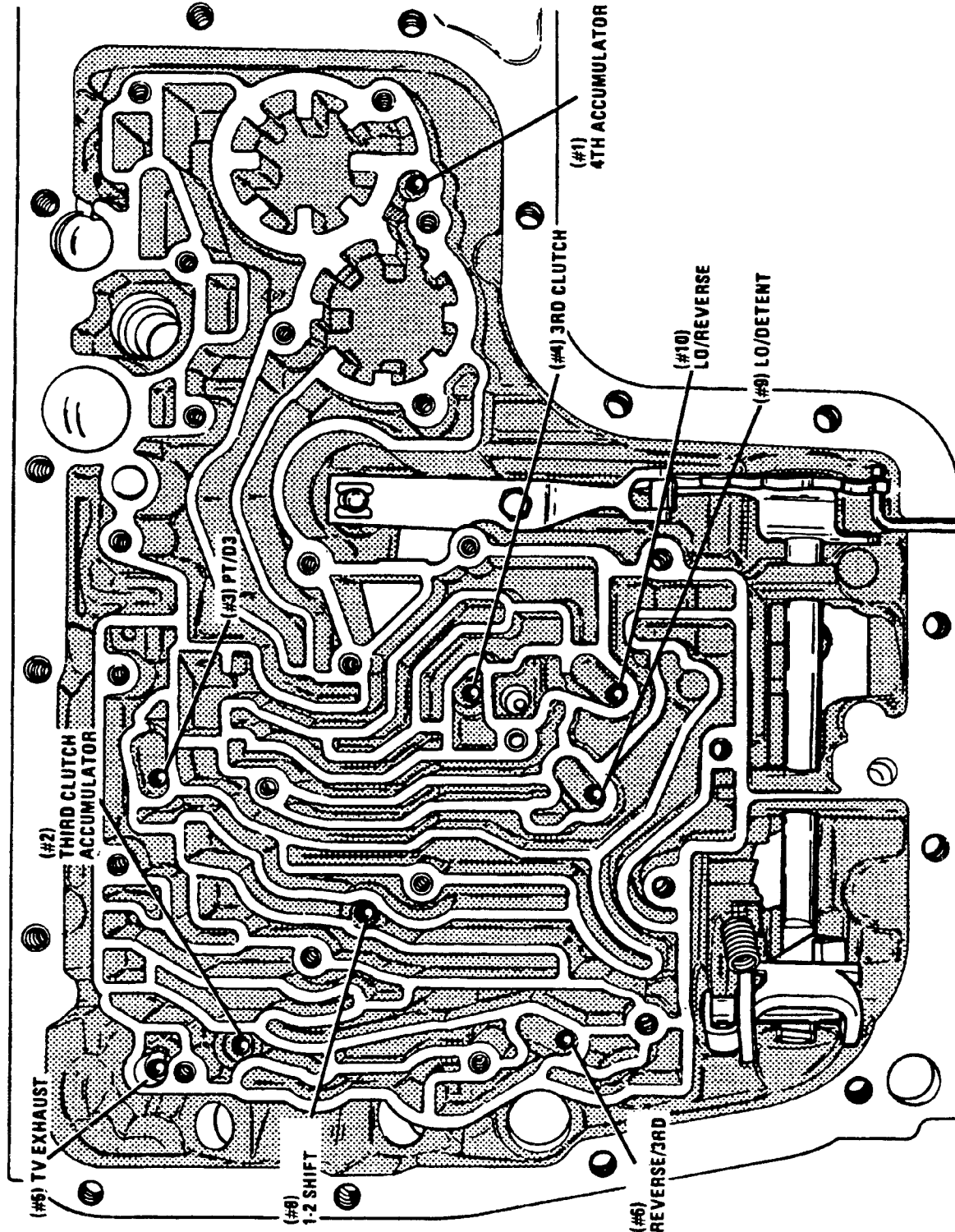
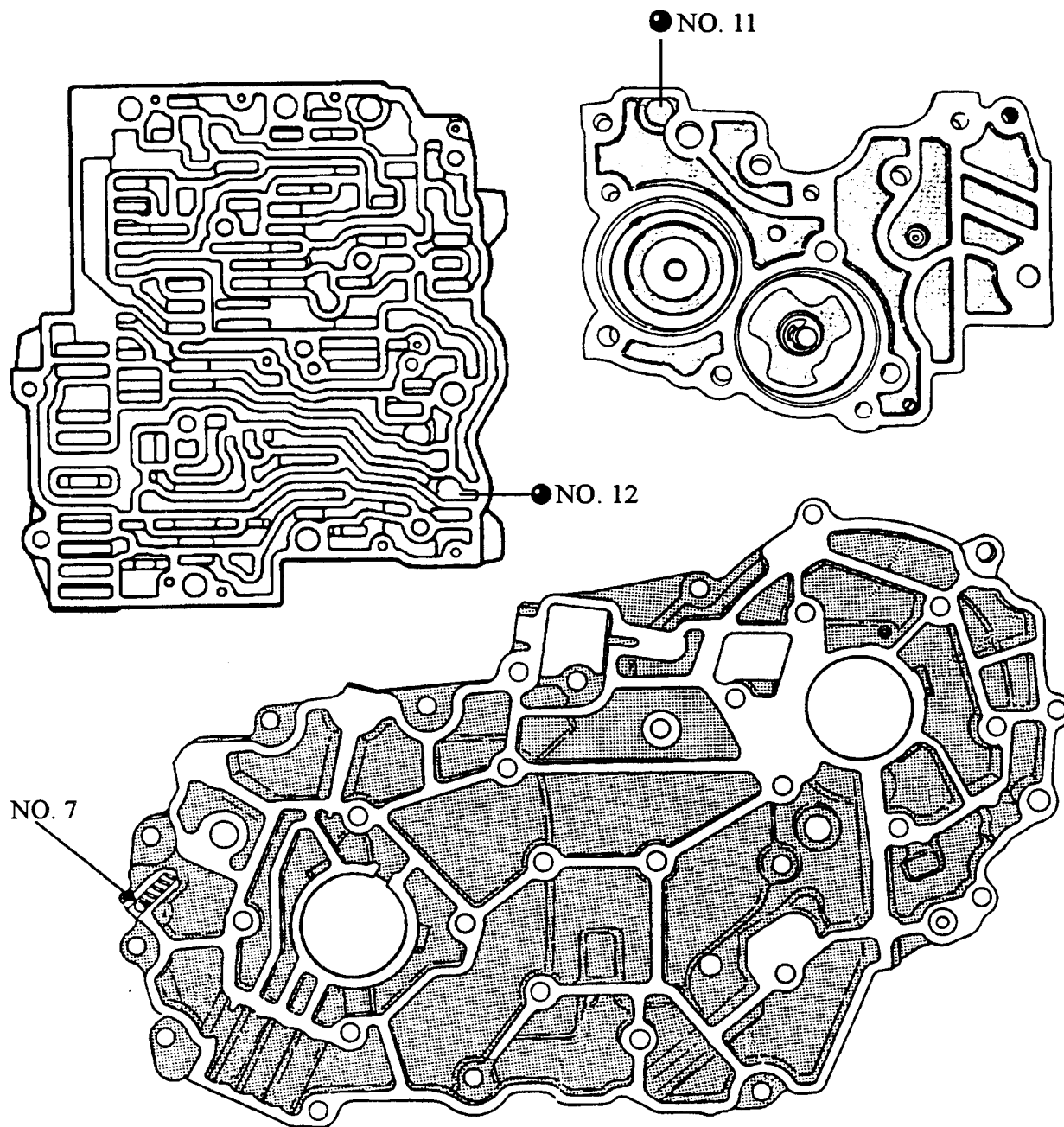


Figure 7

THM 325-4L

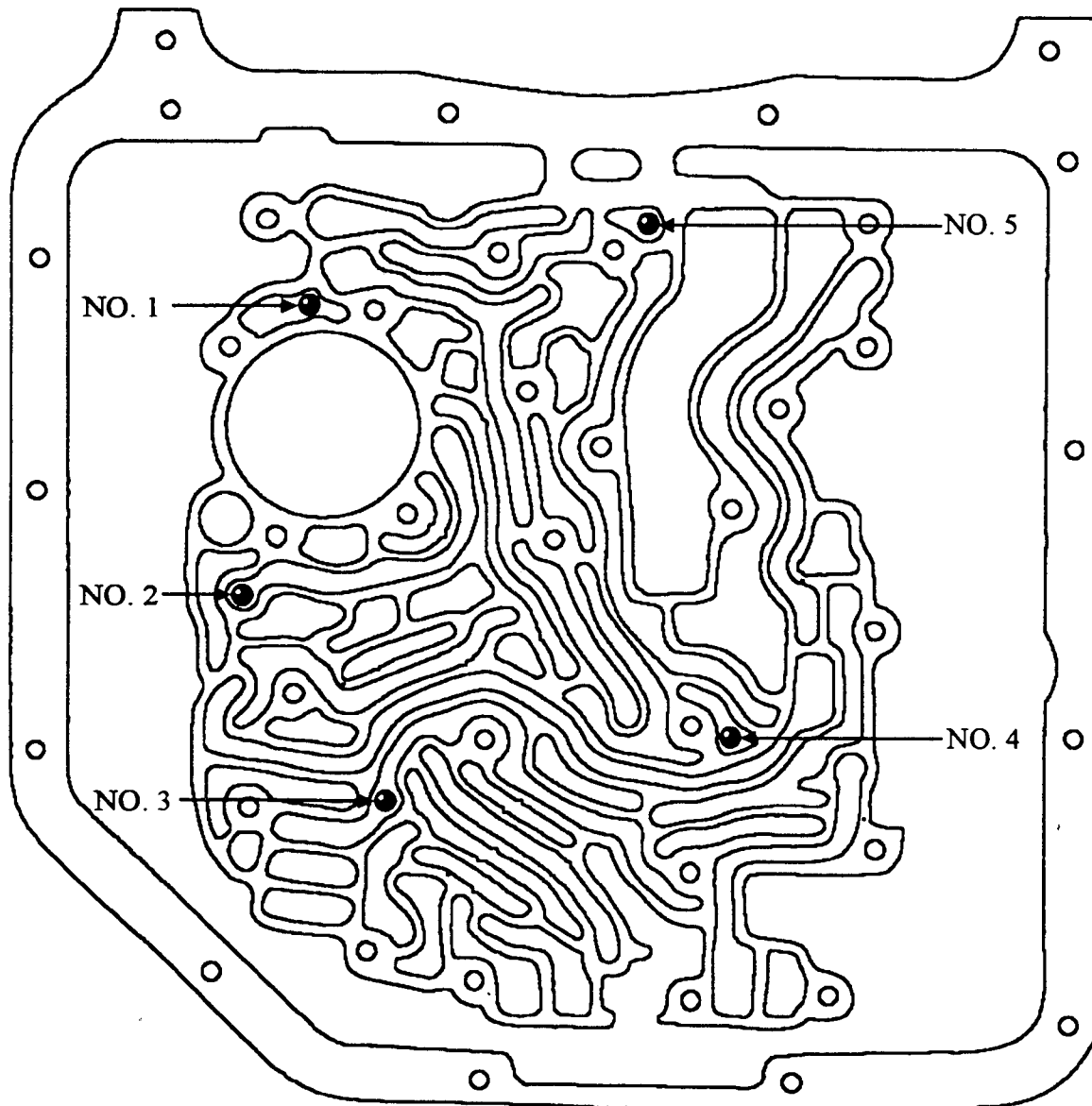
VALVE BODY, ACCUM. BODY & CASE COVER CHECKBALL LOCATIONS



- NO. 7 3RD CLUTCH ACCUMULATOR CHECK BALL & SPRING
- NO. 11 D3 OVERRUN CLUTCH CHECK BALL
- NO. 12 LO/1ST CHECK BALL

Figure 8

THM 350C MAIN CASE CHECKBALL LOCATIONS

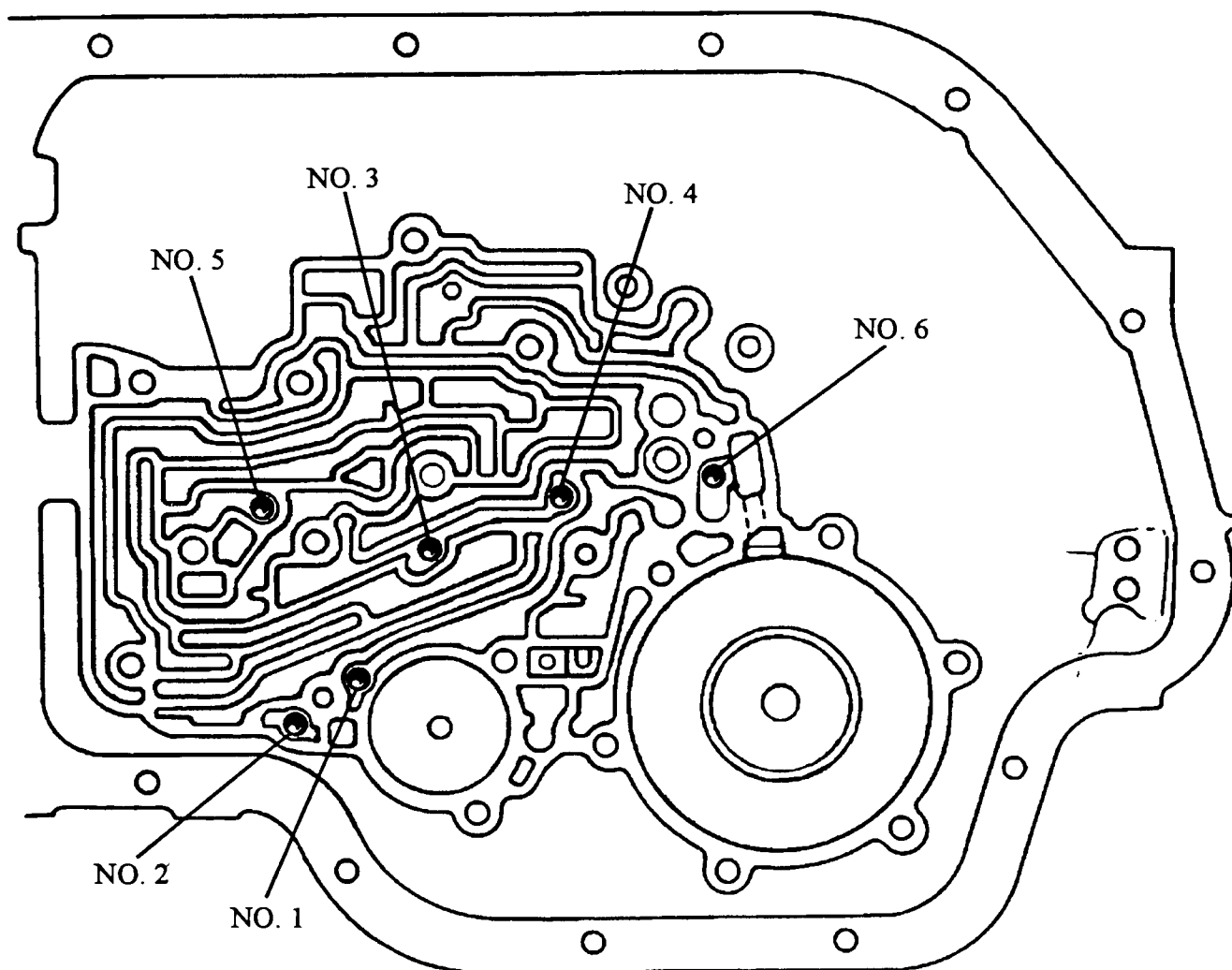


- NO. 1 2-3 ACCUMULATOR BALL
- NO. 2 LINE TO 1-2 ACCUMULATOR (PISTON SIDE)
- NO. 3 MODULATOR BALL
- NO. 4 REVERSE BALL
- NO. 5 CONVERTER RELEASE BALL

Figure 9

THM 400

1965 - 1987 MODELS, SIX BALL CASE

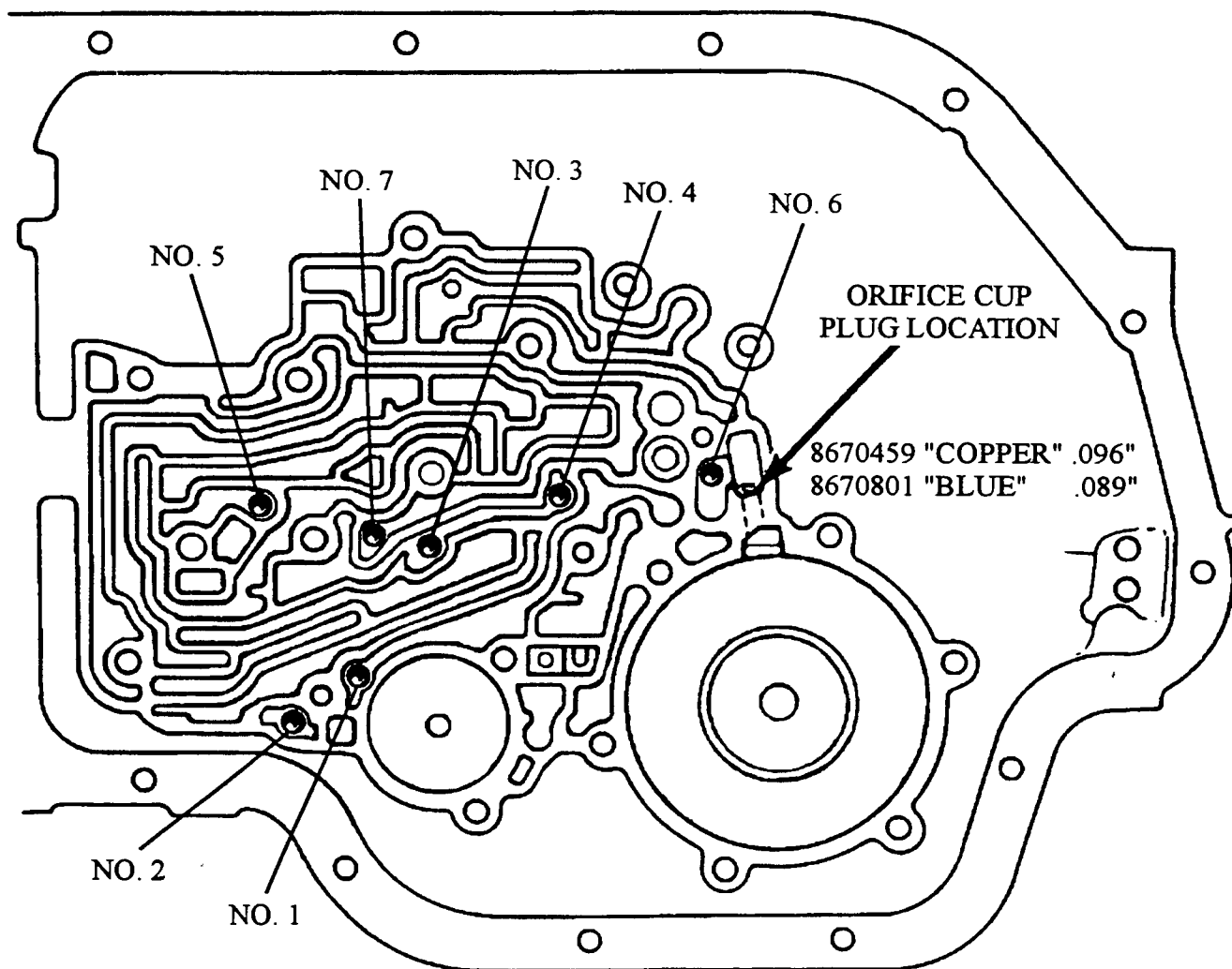


- NO. 1 NON-FUNCTIONAL (OMIT DURING REBUILD)
- NO. 2 INTERMEDIATE SERVO
- NO. 3 2-3 DRIVE
- NO. 4 1-2 SHIFT
- NO. 5 INTERMEDIATE
- NO. 6 LO/REVERSE

Figure 10

THM 400

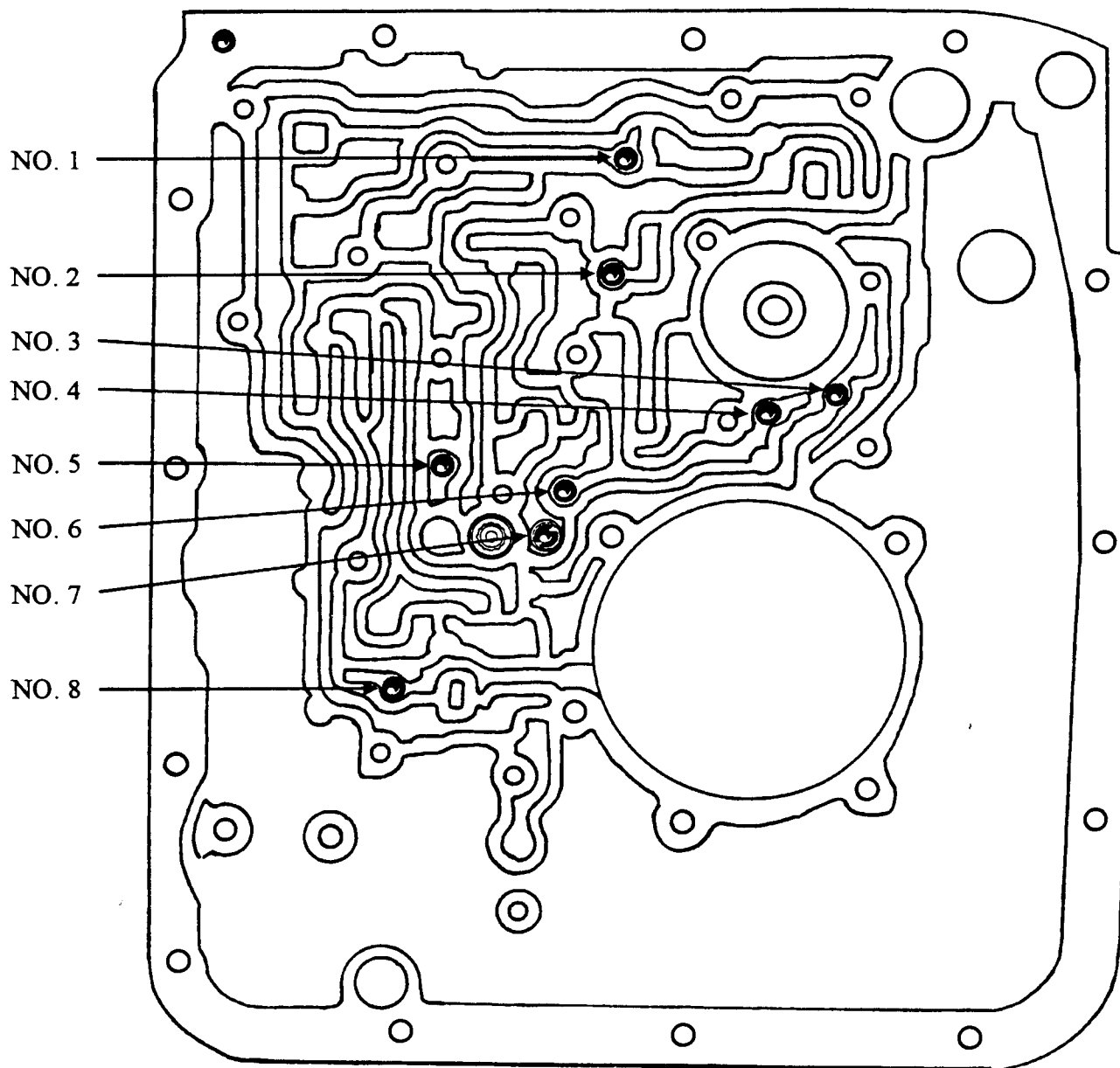
1988 - 1990 MODELS, 7 BALL CASE



- NO. 1 NON-FUNCTIONAL (OMIT DURING REBUILD)
- NO. 2 INTERMEDIATE SERVO
- NO. 3 2-3 DRIVE
- NO. 4 1-2 SHIFT
- NO. 5 INTERMEDIATE
- NO. 6 LO/REVERSE
- NO. 7 REVERSE

Figure 11

THM 425 CASE CHECKBALL LOCATIONS



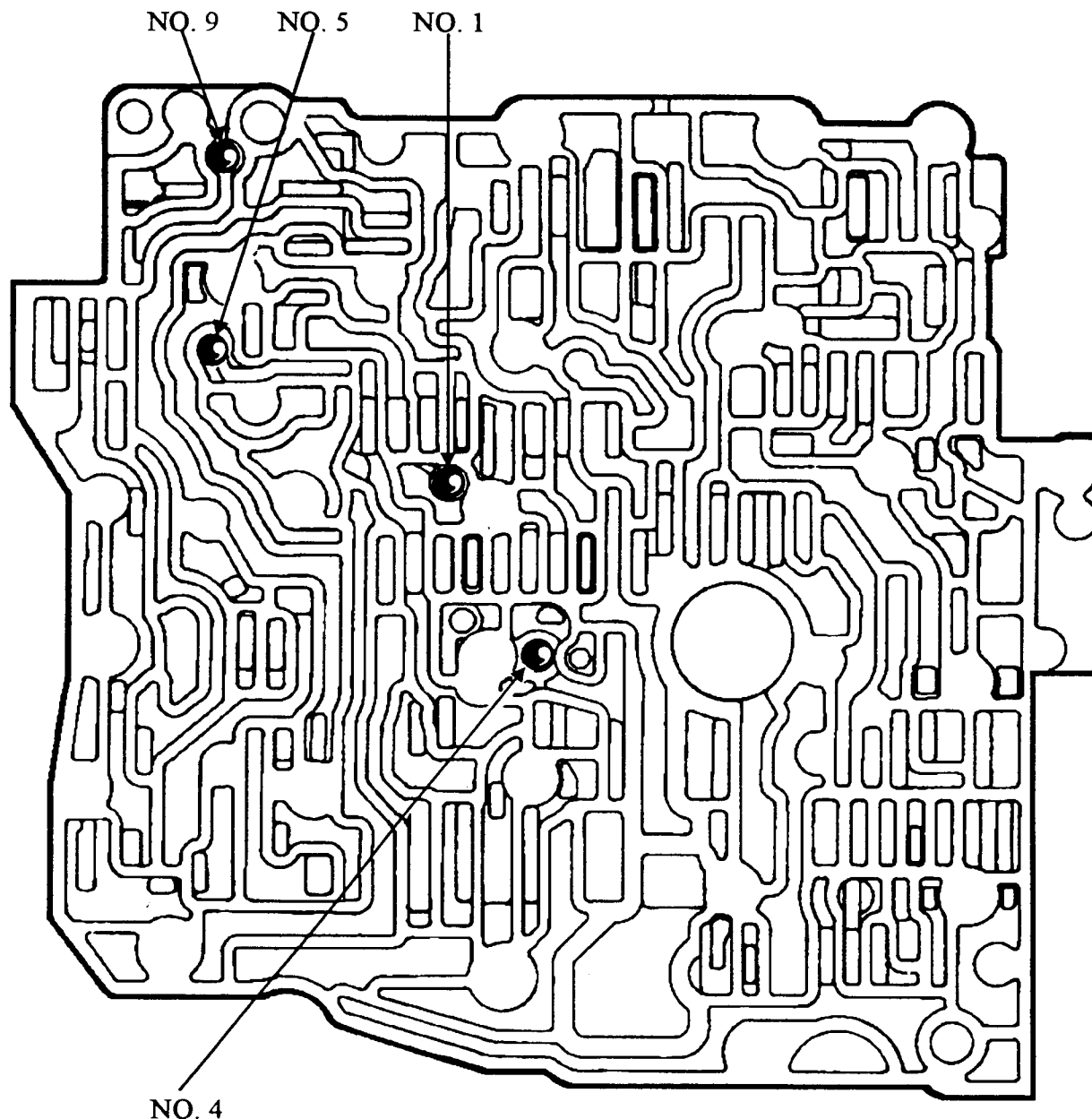
- NO. 1 - RND ORIFICE CONTROL BALL TO FRONT SERVO
- NO. 2 - MODULATOR/INTERMEDIATE LINE BOOST DIRECTIONAL CONTROL BALL
- NO. 3 - DIRECT CLUTCH ACCUMULATOR ORIFICE CONTROL BALL
- NO. 4 - INTERMEDIATE SERVO ORIFICE CONTROL BALL
- NO. 5 - LOW/REVERSE DIRECTIONAL CONTROL BALL
- NO. 6 - INTERMEDIATE CLUTCH ORIFICE CONTROL BALL
- NO. 7 - REVERSE ORIFICE CONTROL BALL
- NO. 8 - LOW/REVERSE SERVO ORIFICE CONTROL BALL

Figure 12

THM 440-T4

VALVE BODY CHECKBALL LOCATIONS

1985 HYDRAULICS ONLY

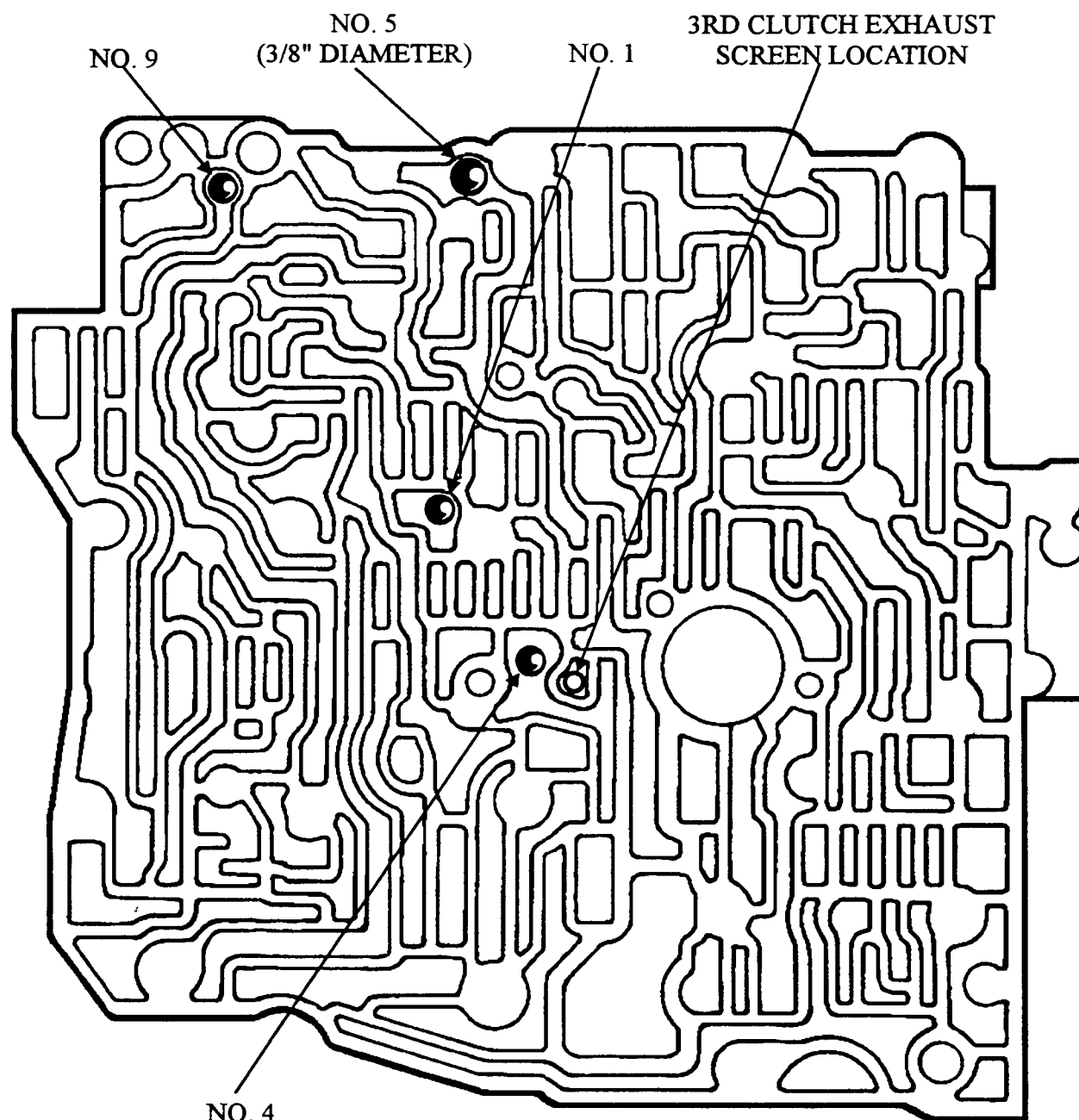


- NO. 1 3-4 SHIFT
- NO. 4 2-3 SHIFT
- NO. 5 2-3 ACCUMULATOR FEED
- NO. 9 REVERSE SERVO FEED

ALL CHECKBALLS IN THIS MODEL ARE 1/4" DIAMETER.

Figure 13

THM 440-T4
VALVE BODY CHECKBALL LOCATIONS
1985-1/2 AND LATER HYDRAULICS ONLY

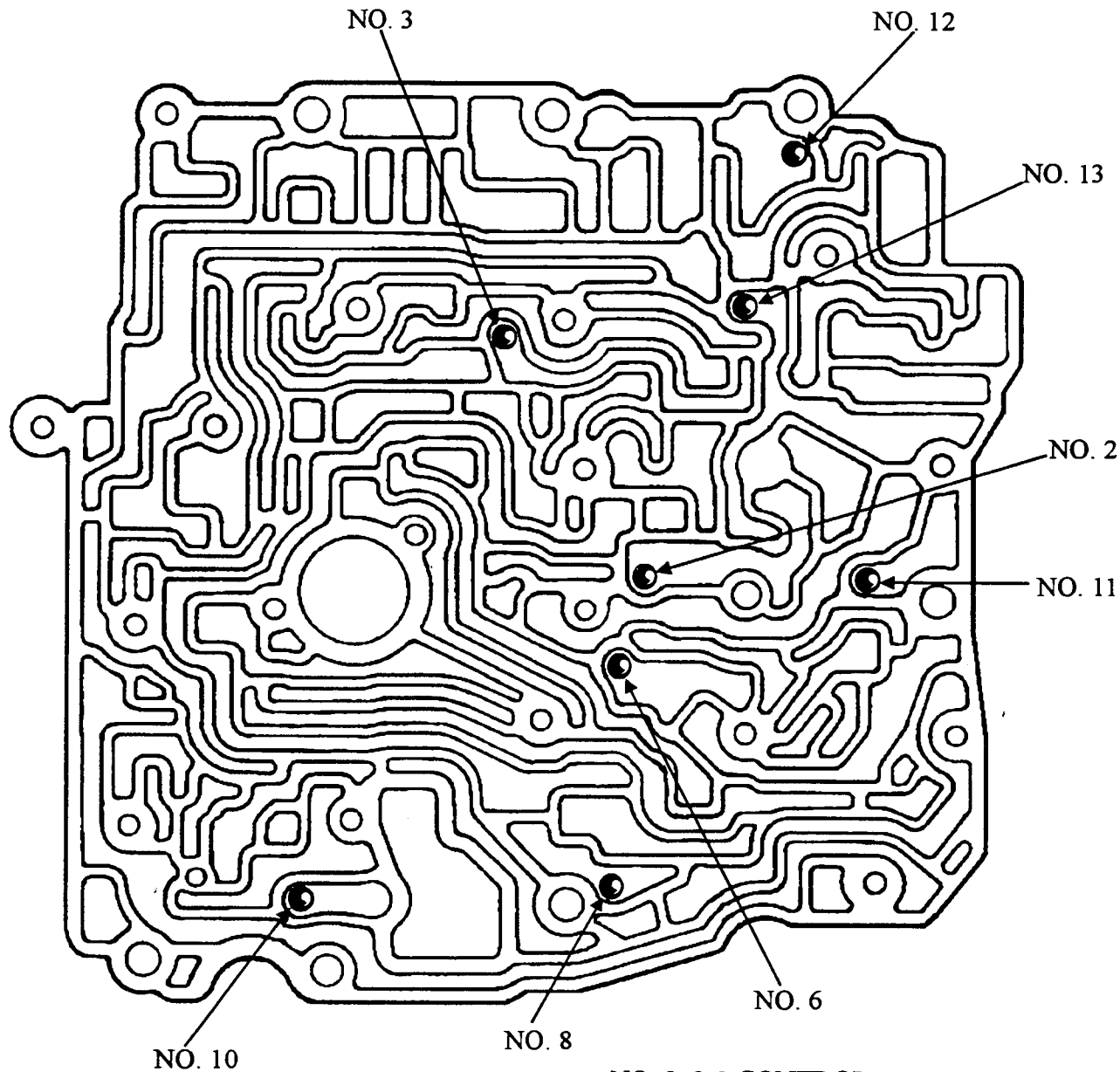


- NO. 1 3-4 SHIFT
- NO. 4 2-3 SHIFT
- NO. 5 2-3 ACCUMULATOR FEED (3/8" DIAMETER)
- NO. 9 REVERSE SERVO FEED

Figure 14

THM 440-T4

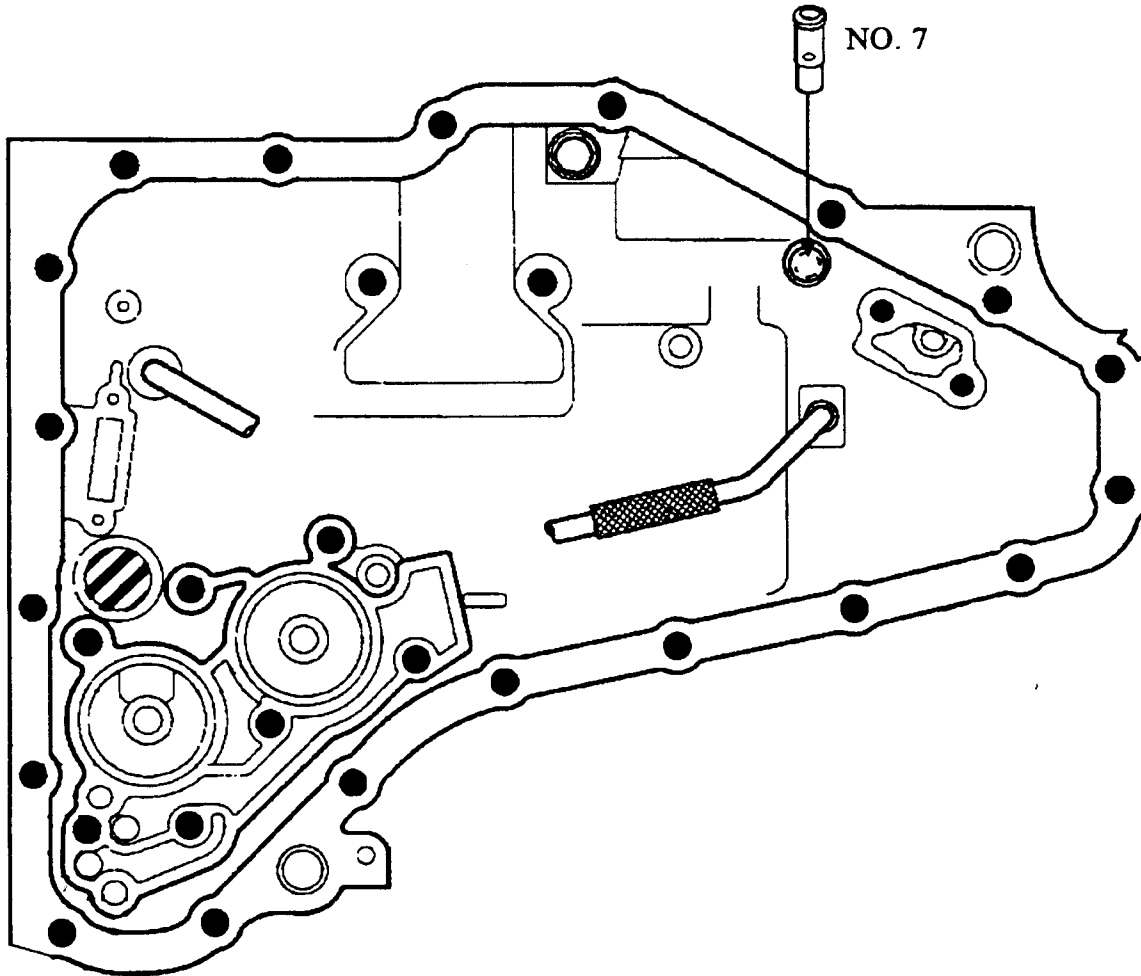
CHANNEL PLATE CHECKBALL LOCATIONS FOR ALL MODELS OF 440-T4



- NO. 2 3-2 CONTROL
- NO. 3 PART THROTTLE/DRIVE 3
- NO. 6 2-3 ACCUMULATOR EXHAUST
- NO. 8 1-2 SHIFT
- NO. 10 TCC APPLY/RELEASE
- NO. 11 THIRD/LO-1ST
- NO. 12 1-2 SERVO FEED
- NO. 13 INPUT CLUTCH/REVERSE

Figure 15

THM 440-T4
MAIN CASE CHECKBALL LOCATION
FOR ALL MODELS OF 440-T4



NO. 7 3RD ACCUMULATOR & 3-2 EXHAUST CAPSULE - 8668287

Figure 16

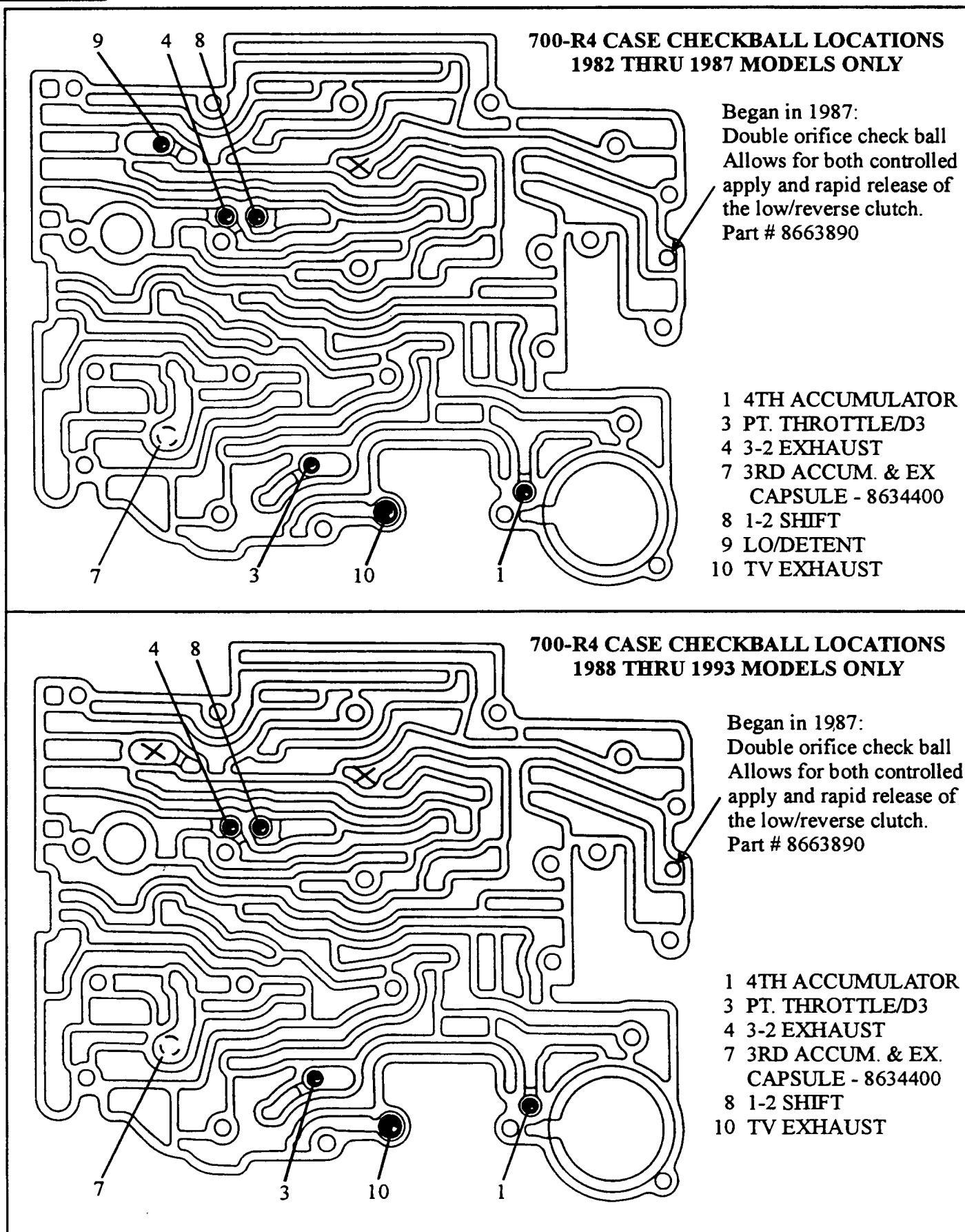
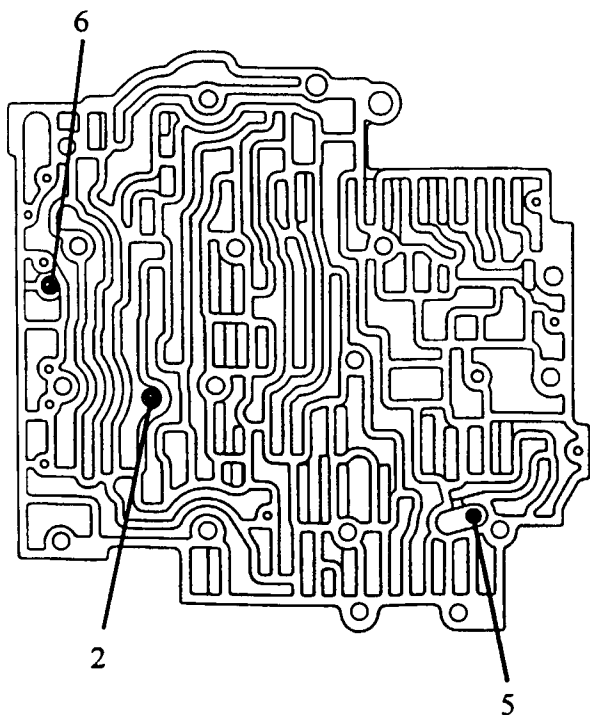
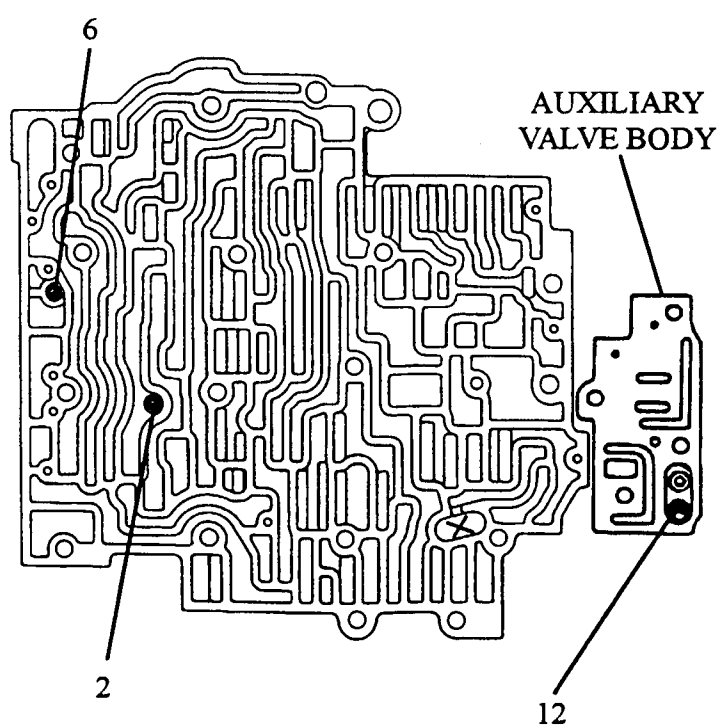


Figure 17

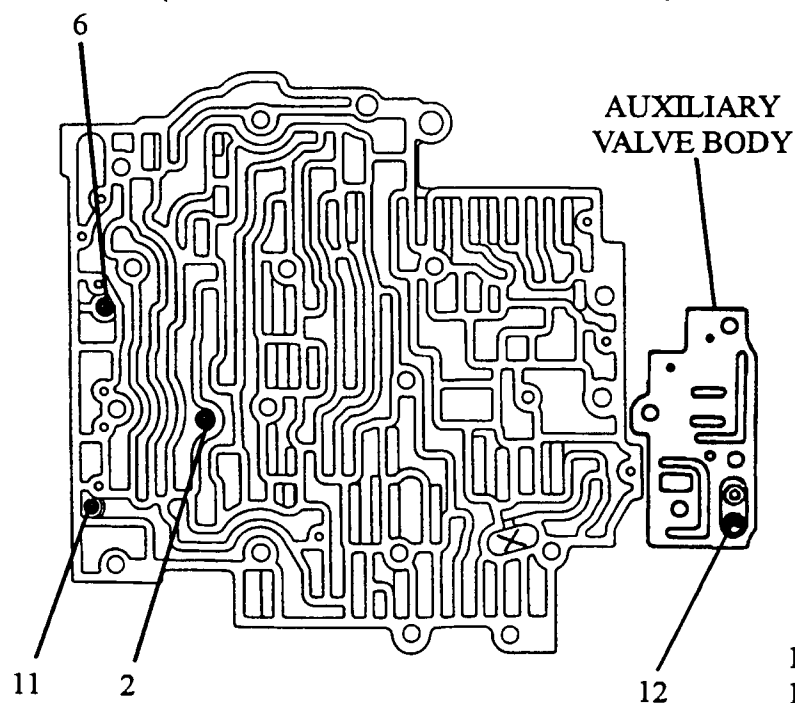
1982 THRU EARLY 1987 VALVE BODY CHECKBALL LOCATIONS (WITHOUT AUXILIARY VALVE BODY)



LATE 1987 THRU 1992 VALVE BODY CHECKBALL LOCATIONS (WITH AUXILIARY VALVE BODY)



1993 MODELS ONLY VALVE BODY CHECKBALL LOCATIONS (WITH AUXILIARY VALVE BODY)

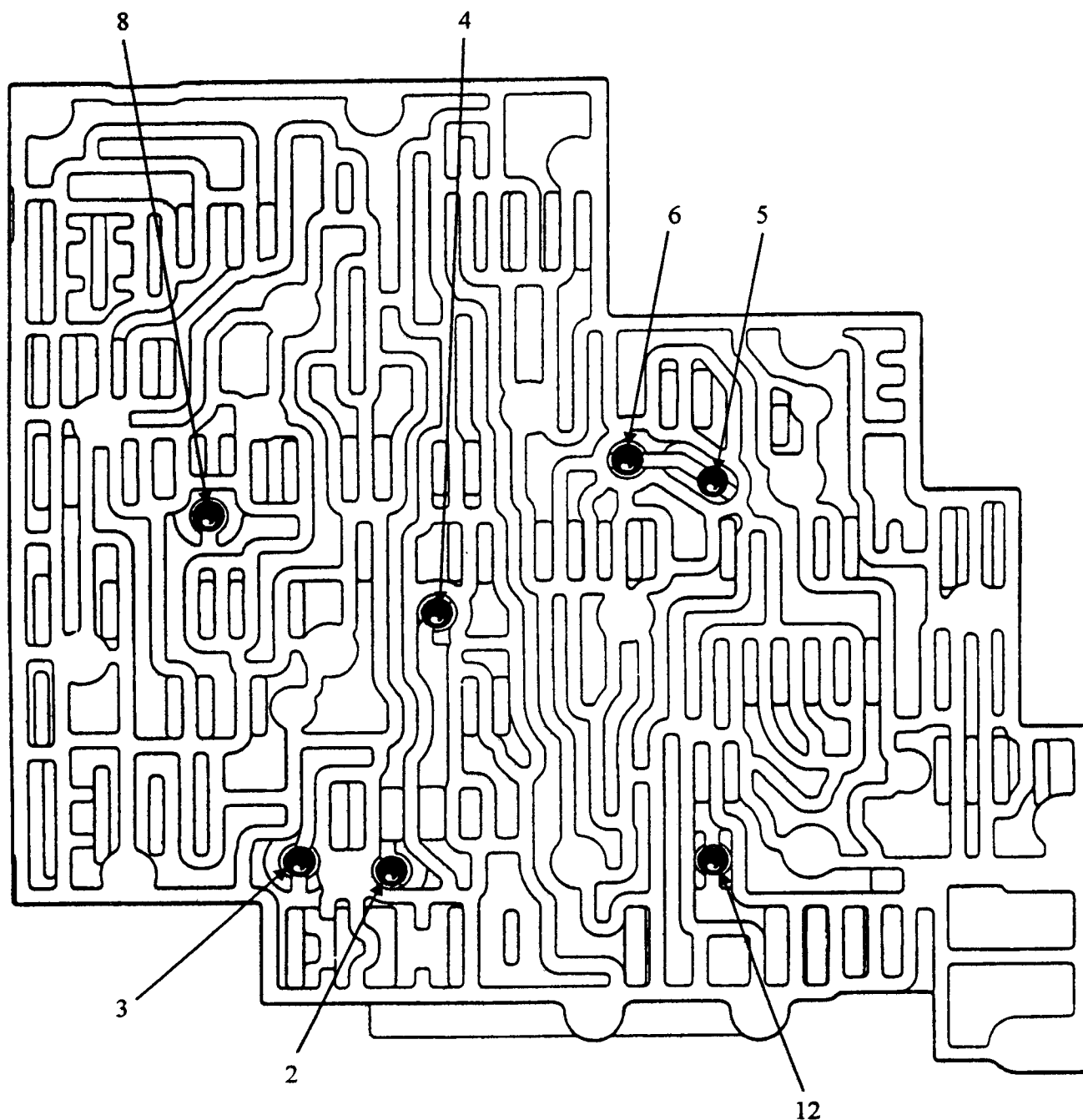


- 2 3RD CLUTCH ACCUM
- 5 LO/REVERSE
- 6 DRIVE 3
- 11 REVERSE INPUT
- 12 FORWARD CLUTCH

Figure 18

AUTOMATIC TRANSMISSION SERVICE GROUP

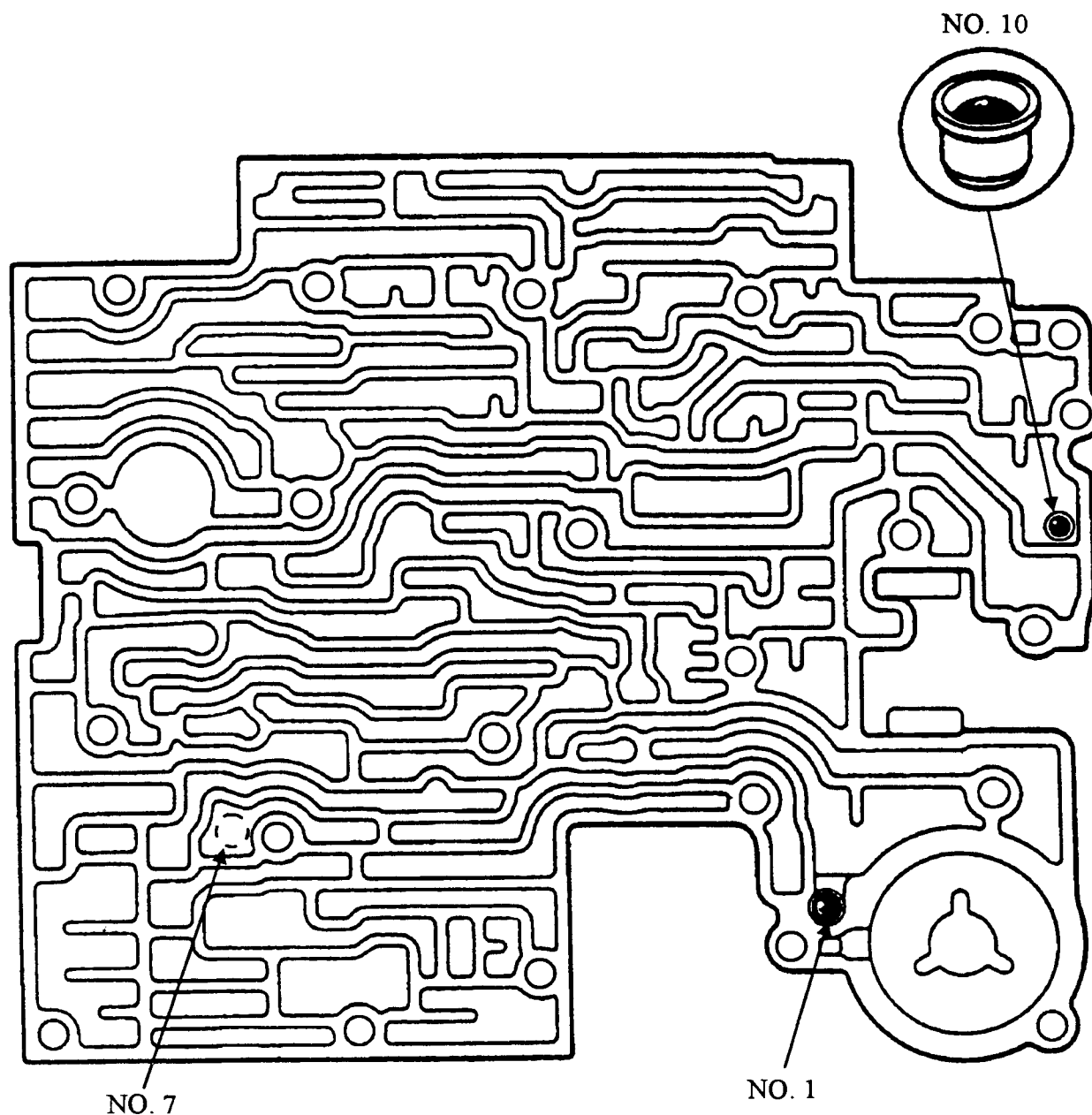
THM 4L60-E VALVE BODY CHECKBALL LOCATIONS



- 2 3RD ACCUMULATOR
- 3 REVERSE INPUT
- 4 3-4 CLUTCH EXHAUST
- 5 OVERRUN CLUTCH FEED
- 6 OVERRUN CLUTCH CONTROL
- 8 1-2 UPSHIFT
- 12 FORWARD CLUTCH ACCUMULATOR

Figure 19

THM 4L60-E CASE CHECKBALL LOCATIONS

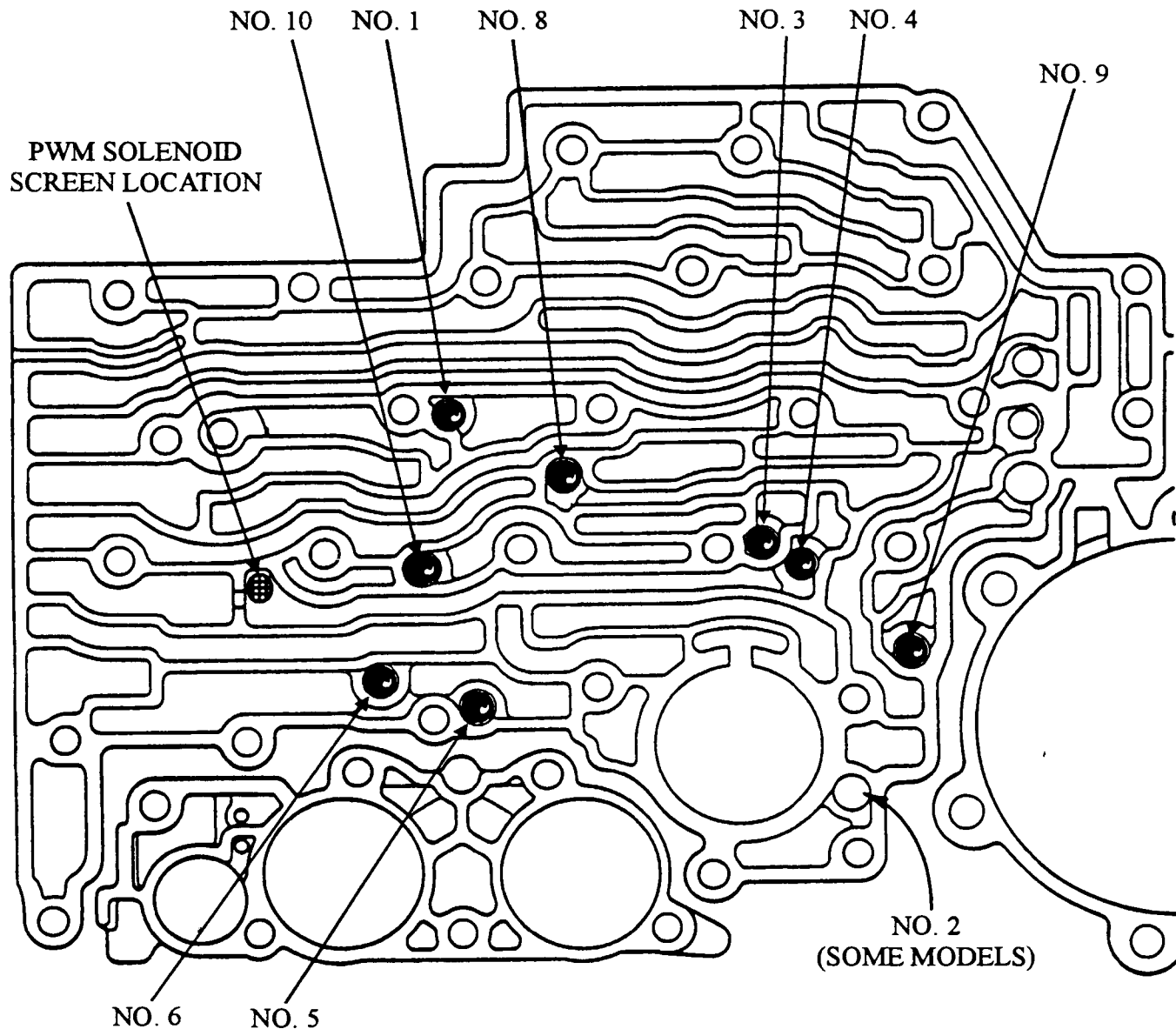


- NO. 1 3-4 ACCUMULATOR
- NO. 7 3RD ACCUMULATOR & EXHAUST CAPSULE - 8634400
- NO. 10 REVERSE BALL CAPSULE - 8663890

Figure 20

AUTOMATIC TRANSMISSION SERVICE GROUP

THM 4L80-E/4L80-EHD CASE CHECKBALL LOCATIONS



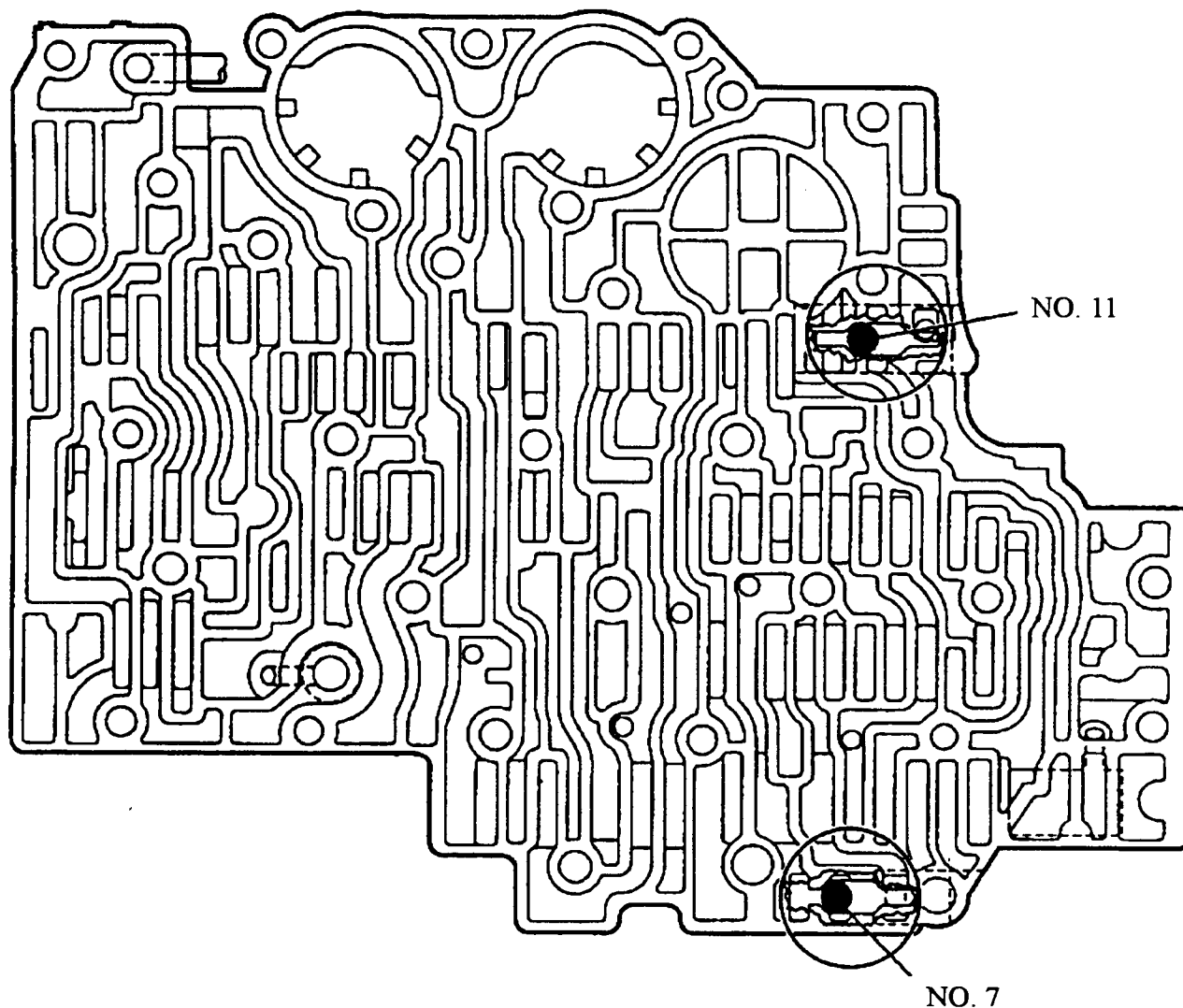
- NO. 1 OVERRUN CLUTCH
- NO. 2 2ND ACCUMULATOR (SOME MODELS)
- NO. 3 FRONT BAND APPLY
- NO. 4 2ND CLUTCH
- NO. 5 3RD ACCUMULATOR
- NO. 6 4TH ACCUMULATOR
- NO. 8 3RD CLUTCH
- NO. 9 REVERSE
- NO. 10 4TH CLUTCH

Figure 21

AUTOMATIC TRANSMISSION SERVICE GROUP

THM 4L80-E/4L80-EHD

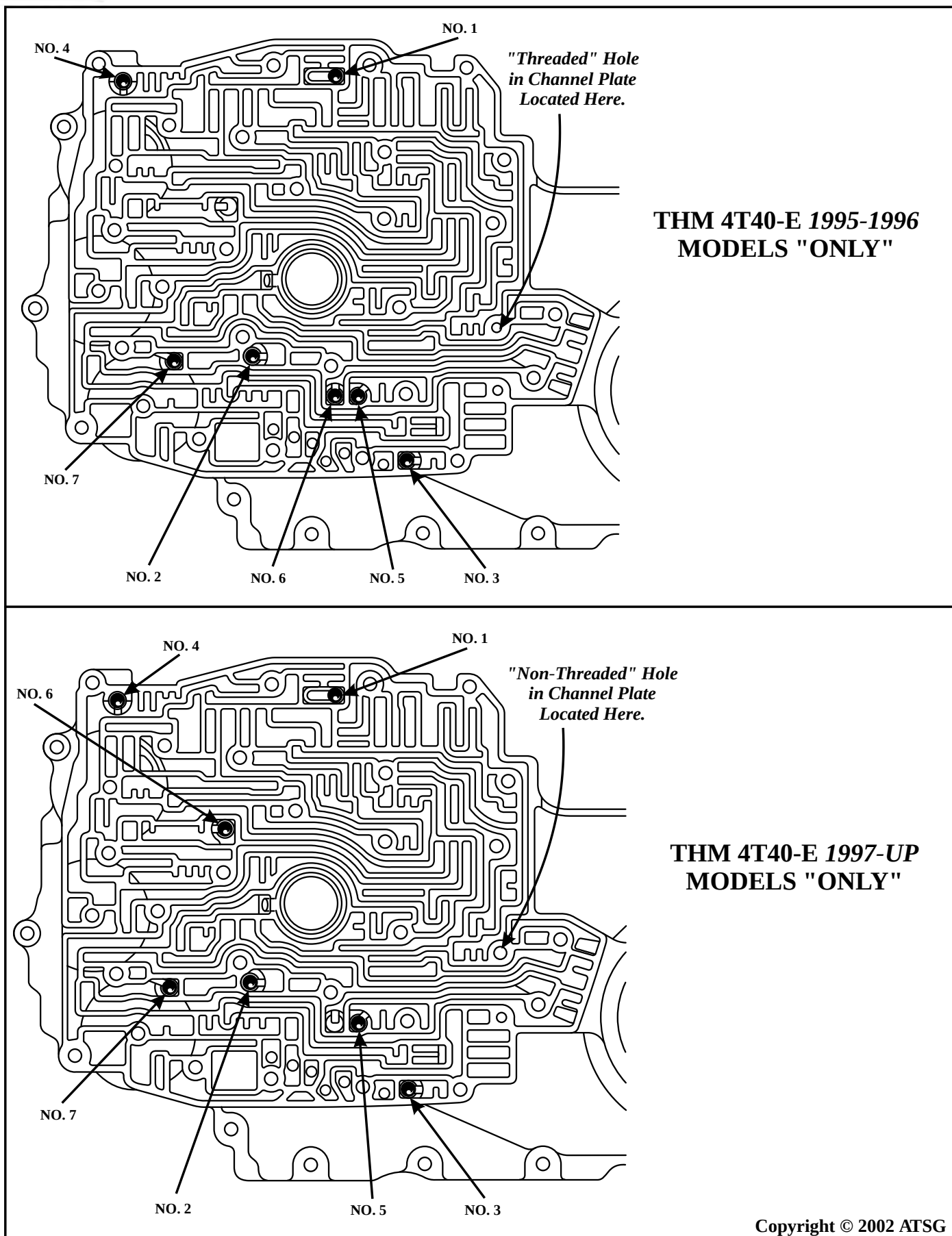
VALVE BODY CHECKBALL LOCATIONS



NO. 7 LO/REVERSE SHUTTLE BALL
NO. 11 3RD/REVERSE SHUTTLE BALL

Figure 22

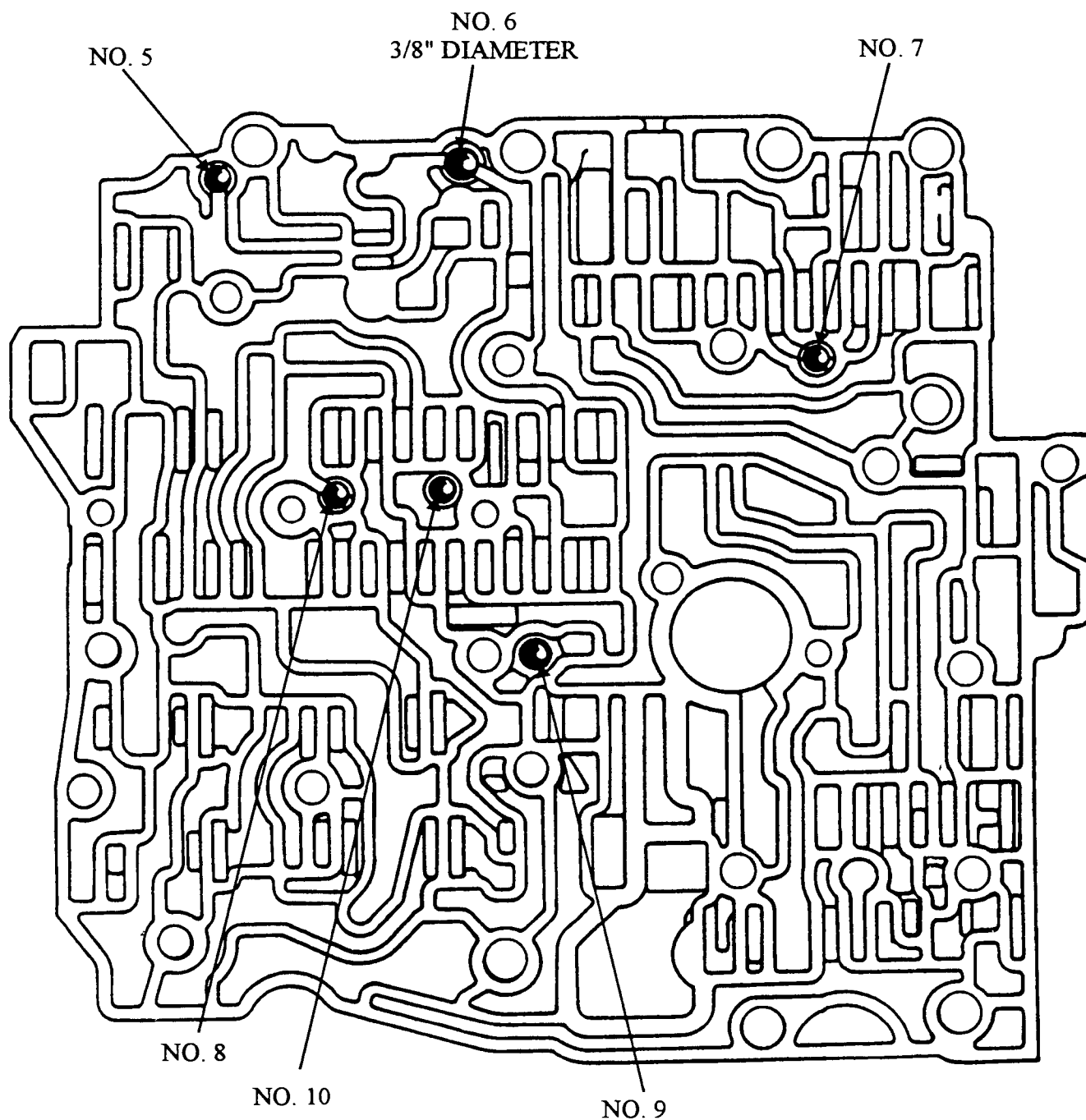
AUTOMATIC TRANSMISSION SERVICE GROUP



Copyright © 2002 ATSG

Figure 23

THM 4T60-E VALVE BODY CHECKBALL LOCATIONS

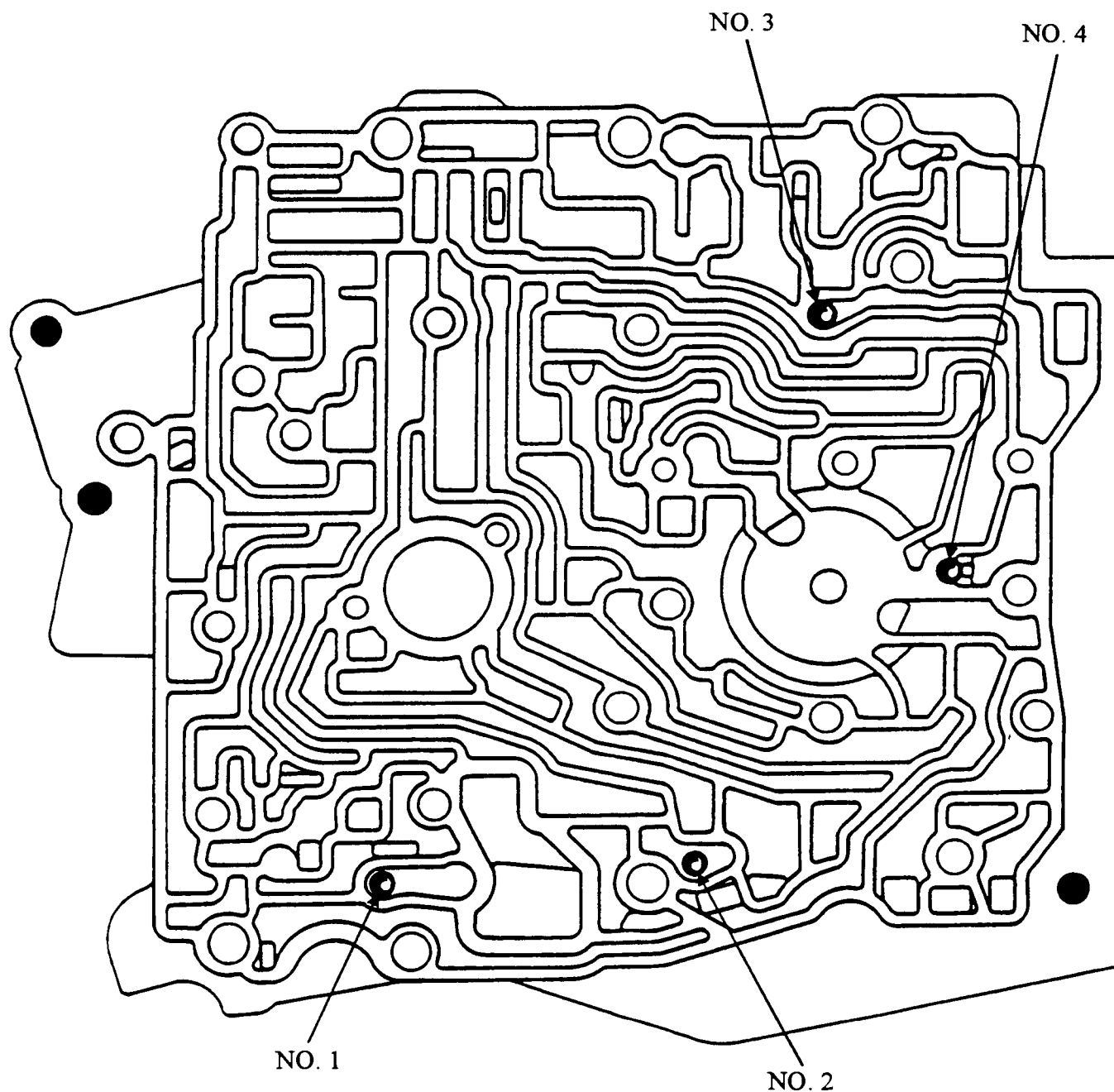


- NO. 5 REVERSE SERVO
- NO. 6 FORWARD SERVO APPLY (3/8" DIAMETER)
- NO. 7 3RD CLUTCH LO-1ST
- NO. 8 MANUAL 2-1 SERVO FEED
- NO. 9 2-3 SHIFT
- NO. 10 3-4 SHIFT

Figure 24

AUTOMATIC TRANSMISSION SERVICE GROUP

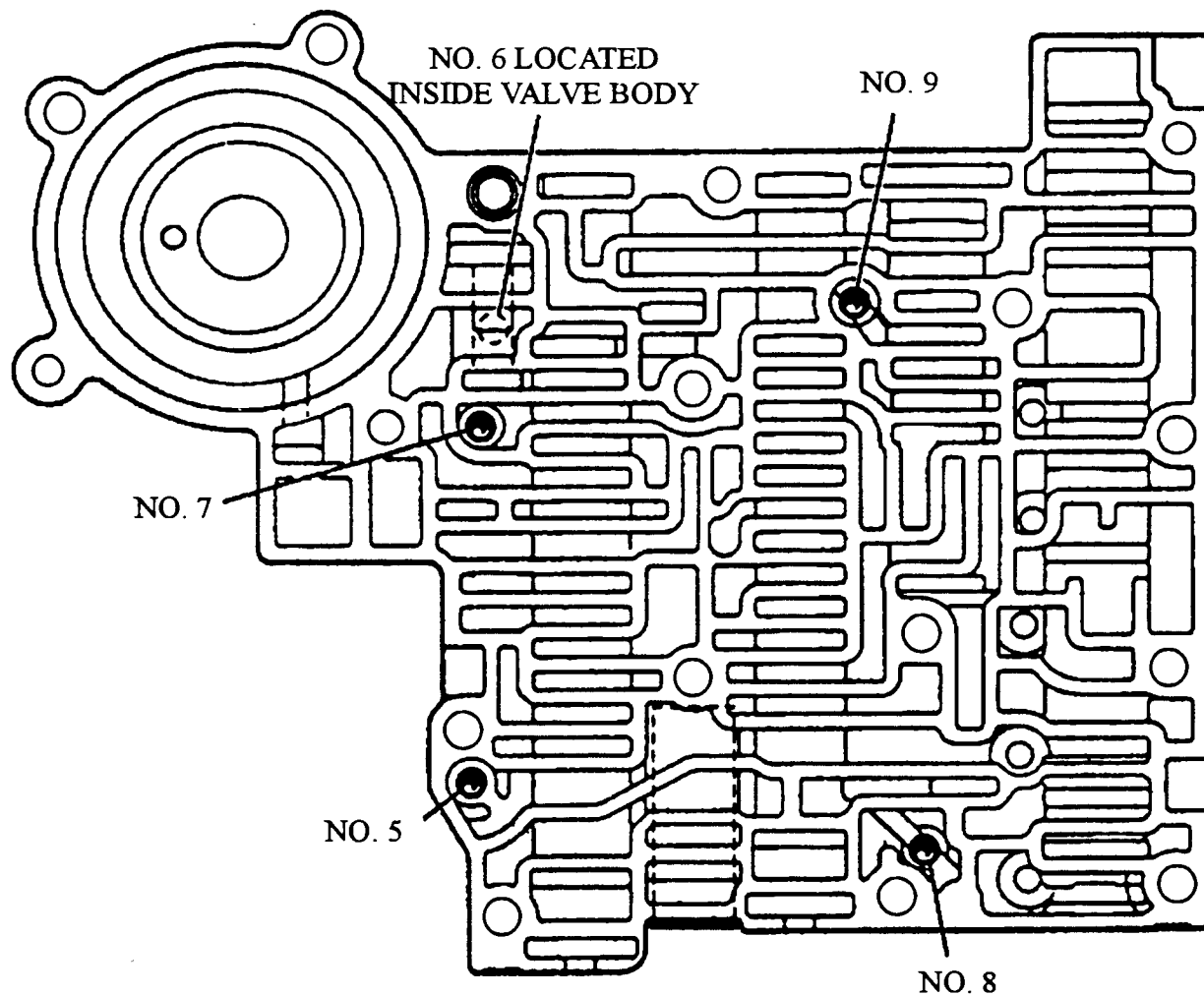
THM 4T60-E CHANNEL PLATE CHECKBALL LOCATIONS



- NO. 1 TCC APPLY/RELEASE
- NO. 2 1-2 SHIFT
- NO. 3 INPUT CLUTCH/PRN
- NO. 4 3RD CLUTCH/LO-1ST

Figure 25

THM 4T80-E VALVE BODY CHECKBALL LOCATIONS

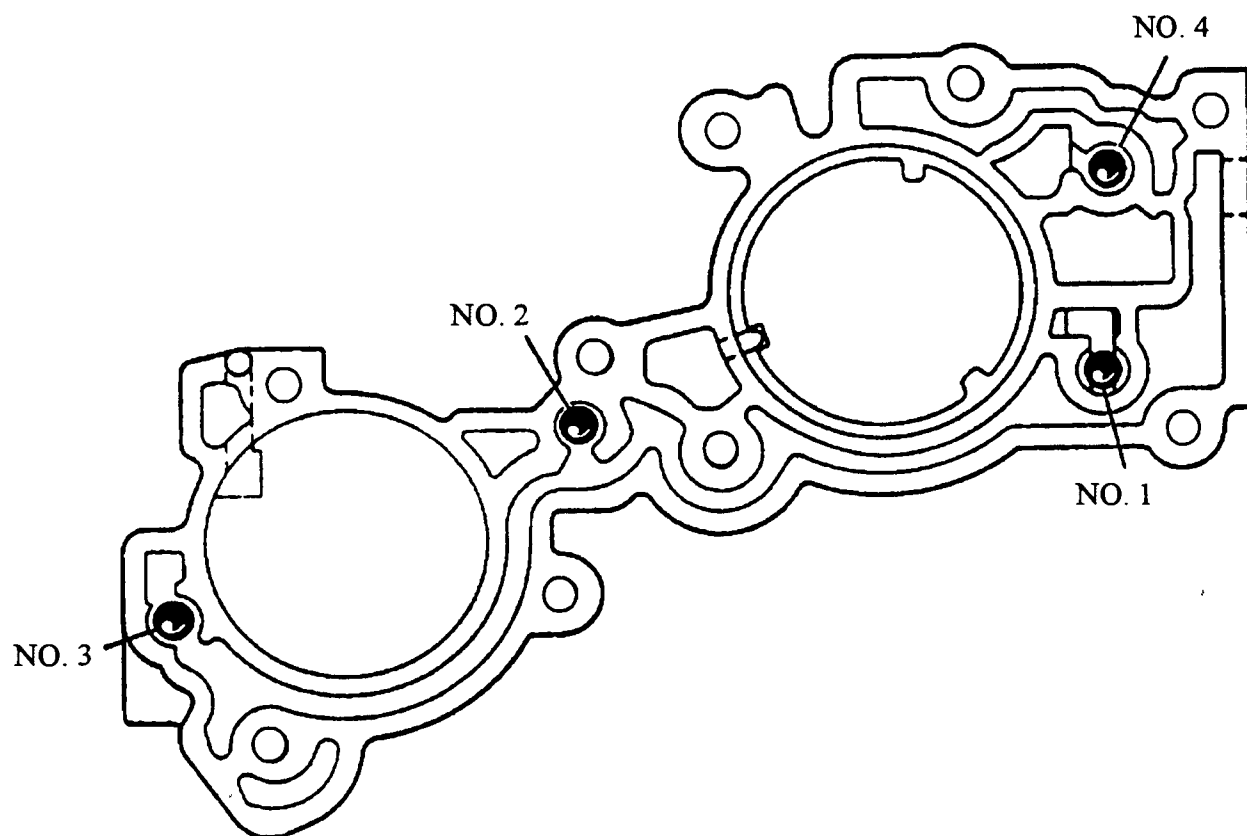


- NO. 5 FORWARD CLUTCH
- NO. 6 REV BAND/LO-REV BAND REDUCE
- NO. 7 REVERSE CLUTCH
- NO. 8 LO
- NO. 9 COAST CLUTCH FEED

Figure 26

THM 4T80-E

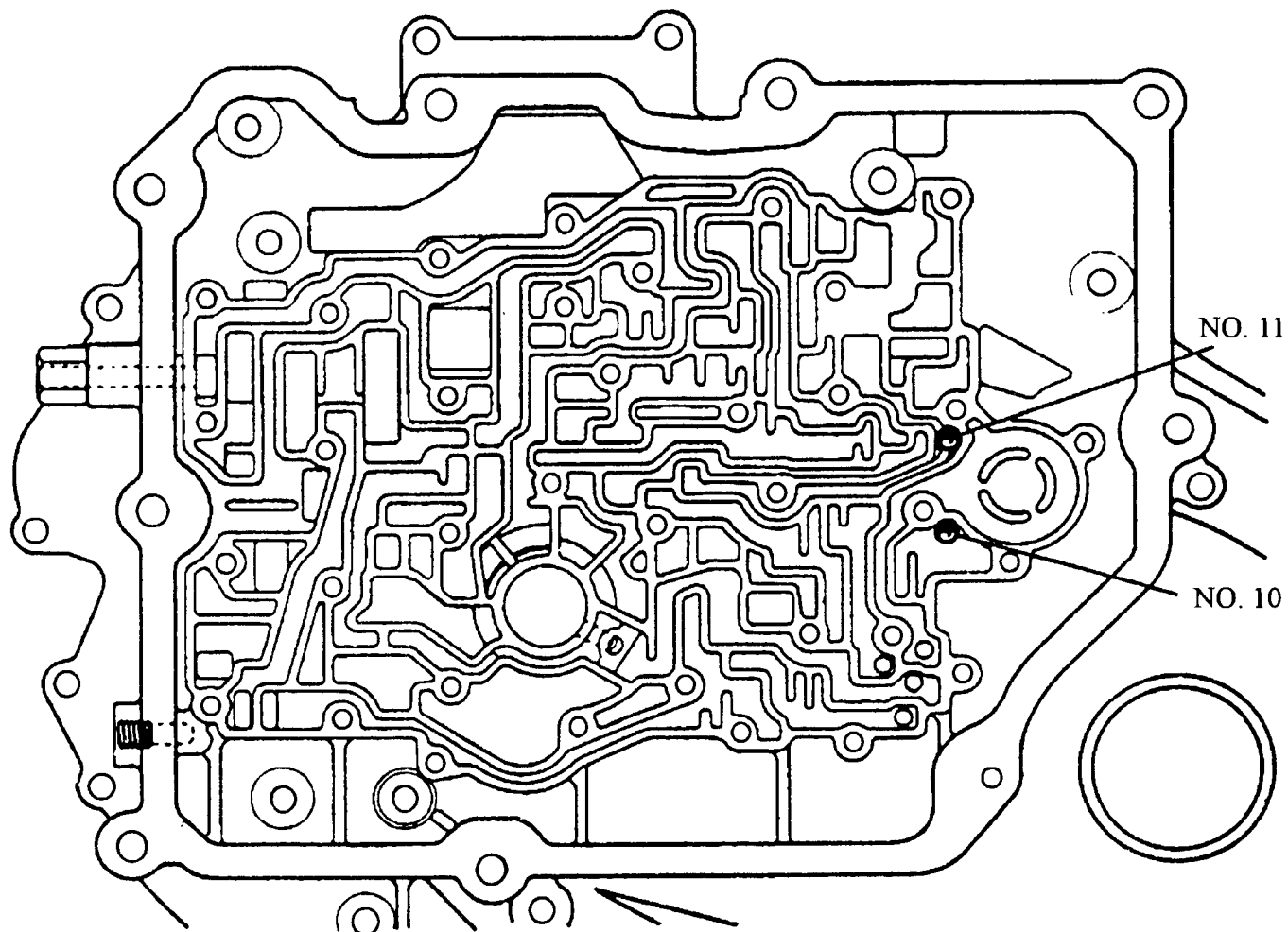
ACCUMULATOR BODY CHECKBALL LOCATIONS



- NO. 1 FORWARD CLUTCH
- NO. 2 1-2 ACCUMULATOR
- NO. 3 3-4 ACCUMULATOR
- NO. 4 REVERSE CLUTCH

Figure 27

4T80-E CASE COVER CHECKBALL LOCATIONS



NO. 10 2-3 ACCUMULATOR
NO. 11 3RD CLUTCH

Figure 28

TAAT
SATURN UPPER VALVE BODY CHECKBALL LOCATIONS

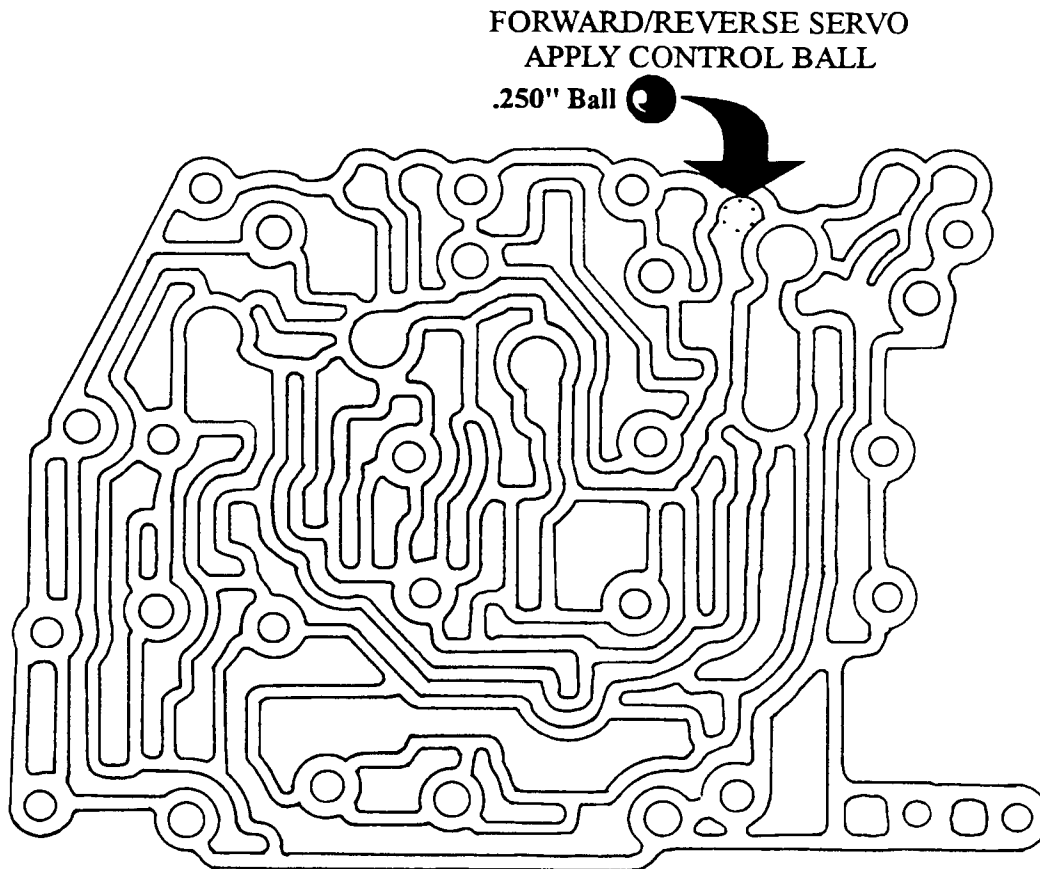


Figure 29

TAAT

SATURN LOWER VALVE BODY CHECKBALL LOCATIONS

BOTH BALLS FUNCTION TOGETHER TO CONTROL FIRST CLUTCH APPLY AND SERVO RELEASE IN ALL FORWARD RANGES

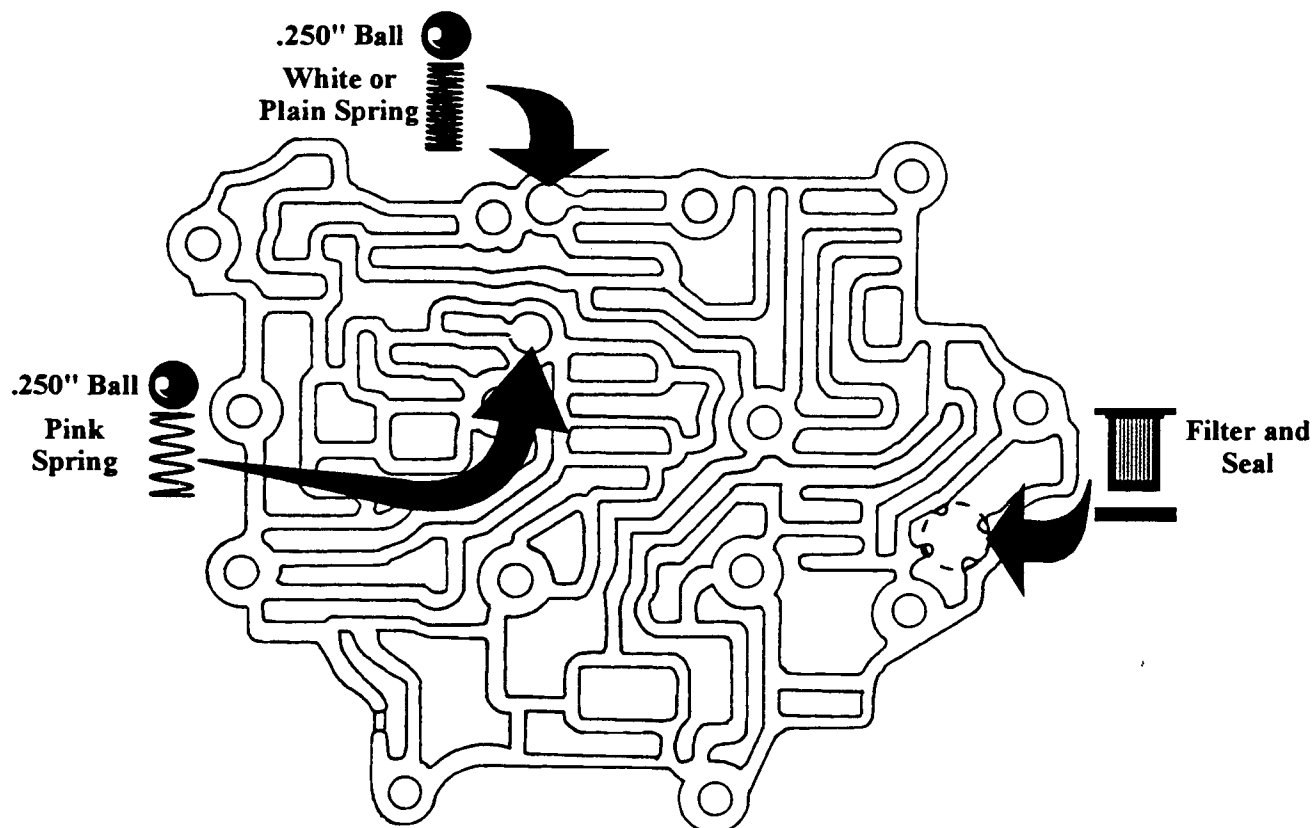
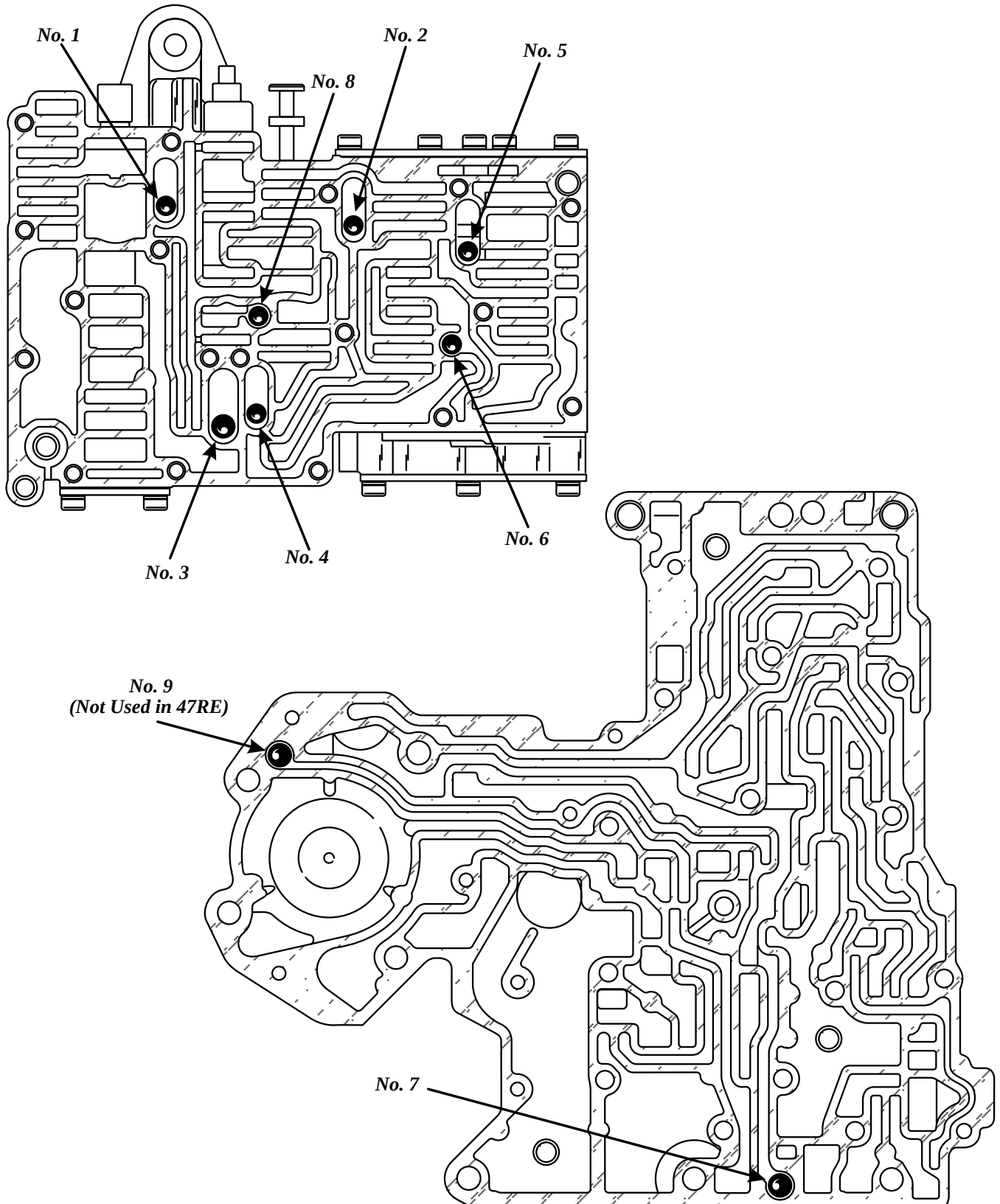


Figure 30

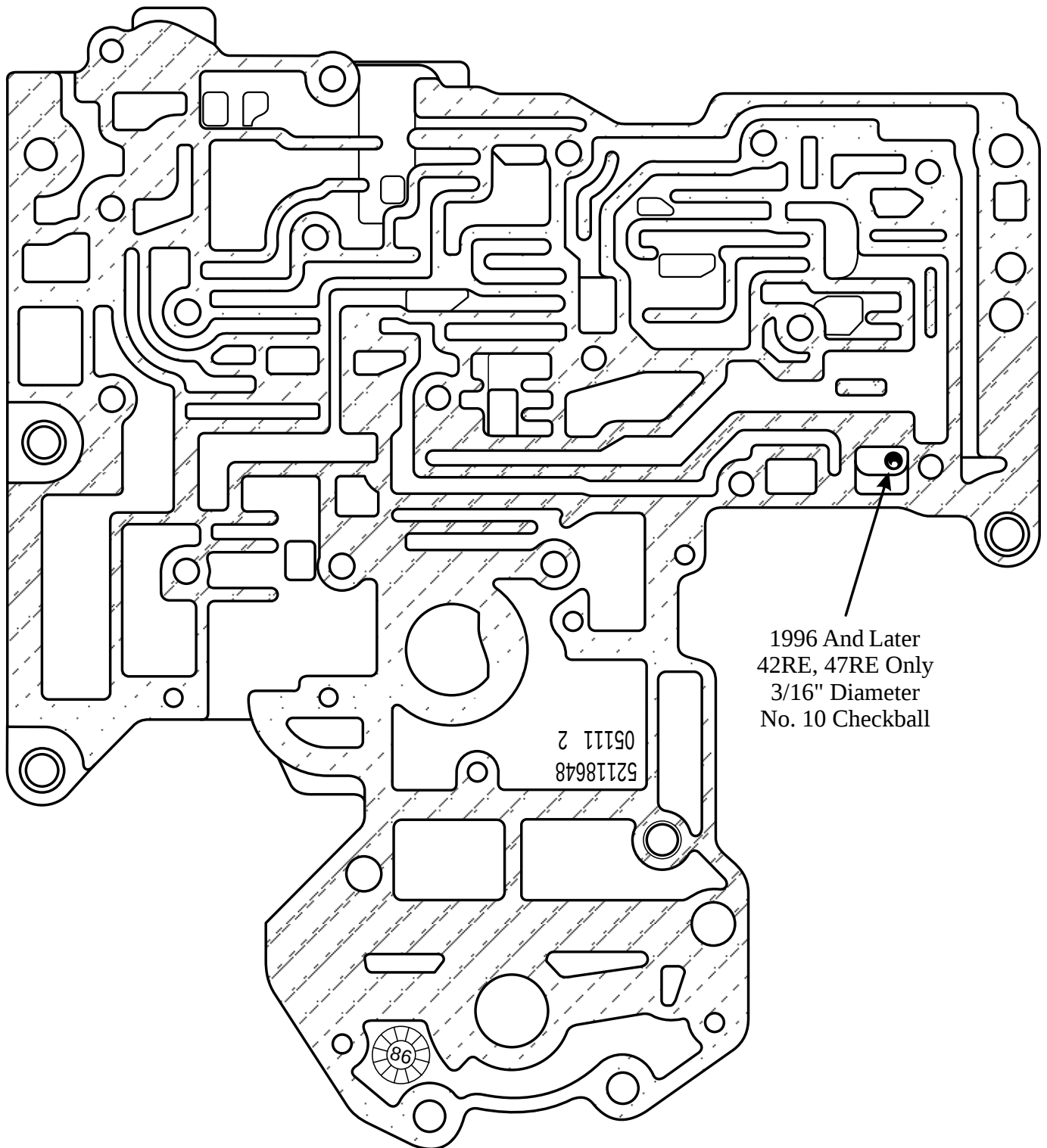
A904, A727, A500, A518, 42RE, 47RE
MAIN VALVE BODY AND TRANSFER PLATE "UPPERSIDE"



Copyright © 2002 ATSG

Figure 31

TRANSFER PLATE "LOWER SIDE"
CHECKBALL LOCATIONS, 1996-UP 42RE, 47RE ONLY

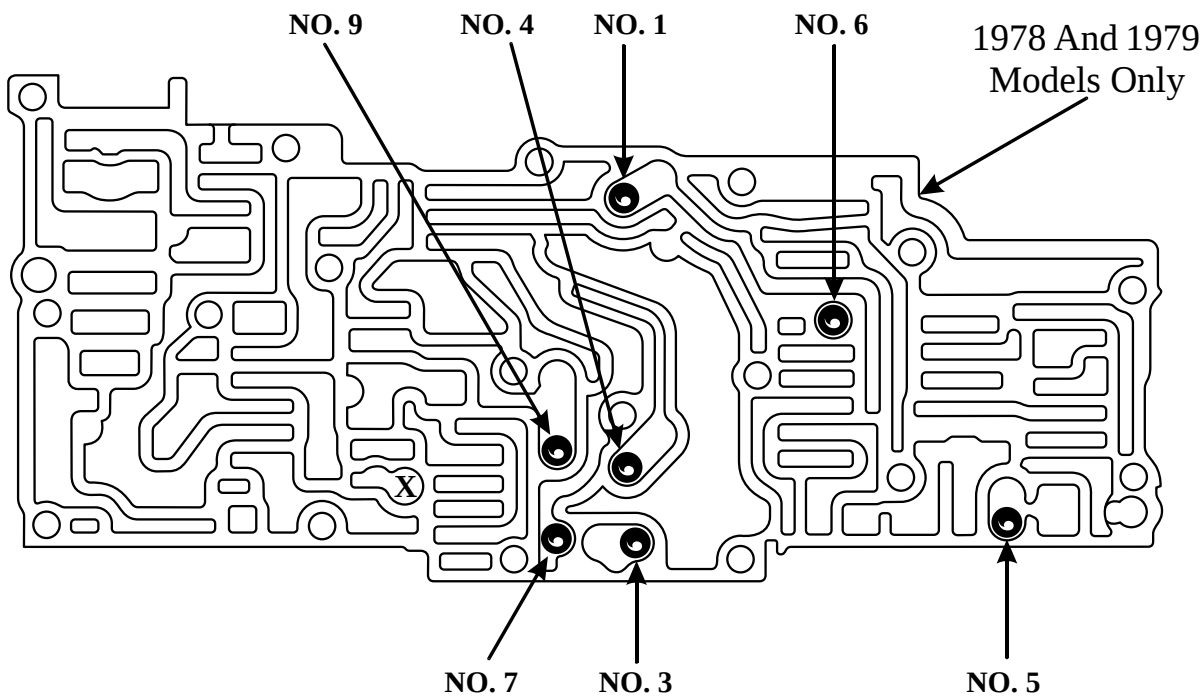


ProCarManuals.com

Copyright © 2002 ATSG

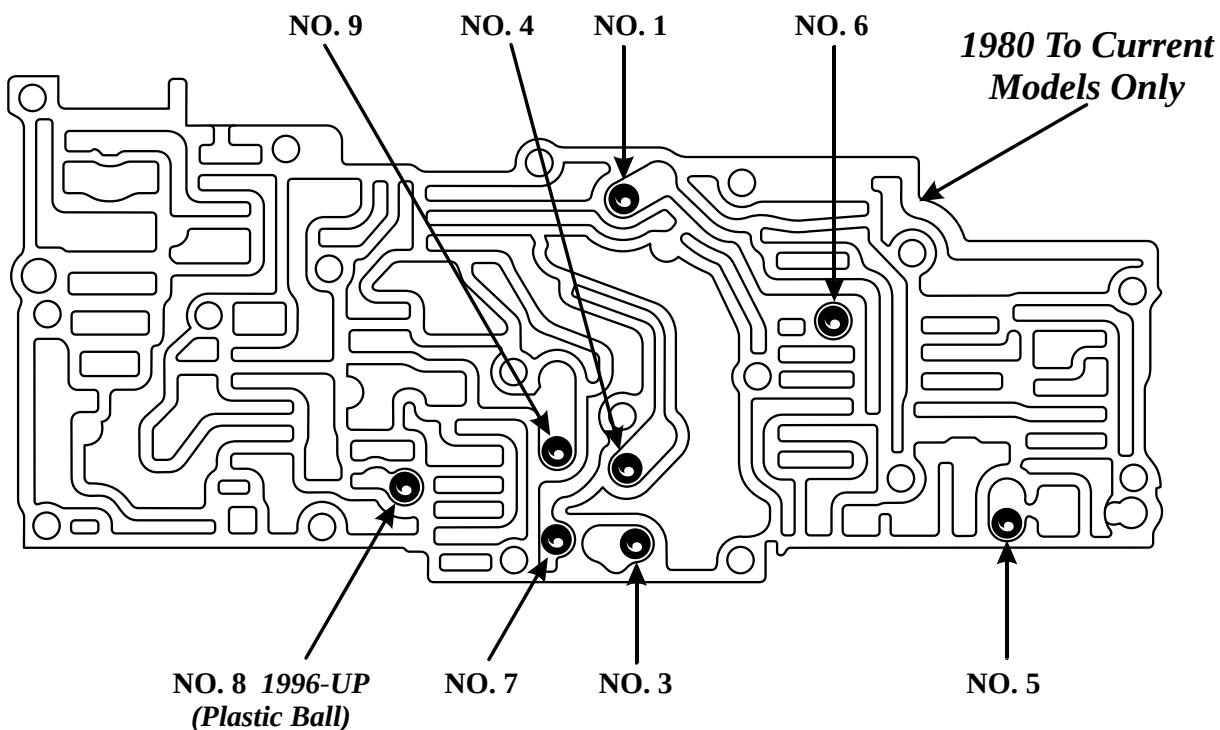
Figure 32

AUTOMATIC TRANSMISSION SERVICE GROUP



NO. 1 Manual Low Control Checkball
NO. 3 3rd/Reverse Shuttle Ball
NO. 4 Low/Reverse Shuttle Ball
NO. 5 TV And Line Control To Shift Valves

NO. 6 Intermediate Accumulator And Front Servo Control Checkball
NO. 7 Forward Clutch Control Checkball
NO. 8 TV Feed Control Checkball
NO. 9 TV Feed, 1-2 Accumulator And Exhaust Checkball



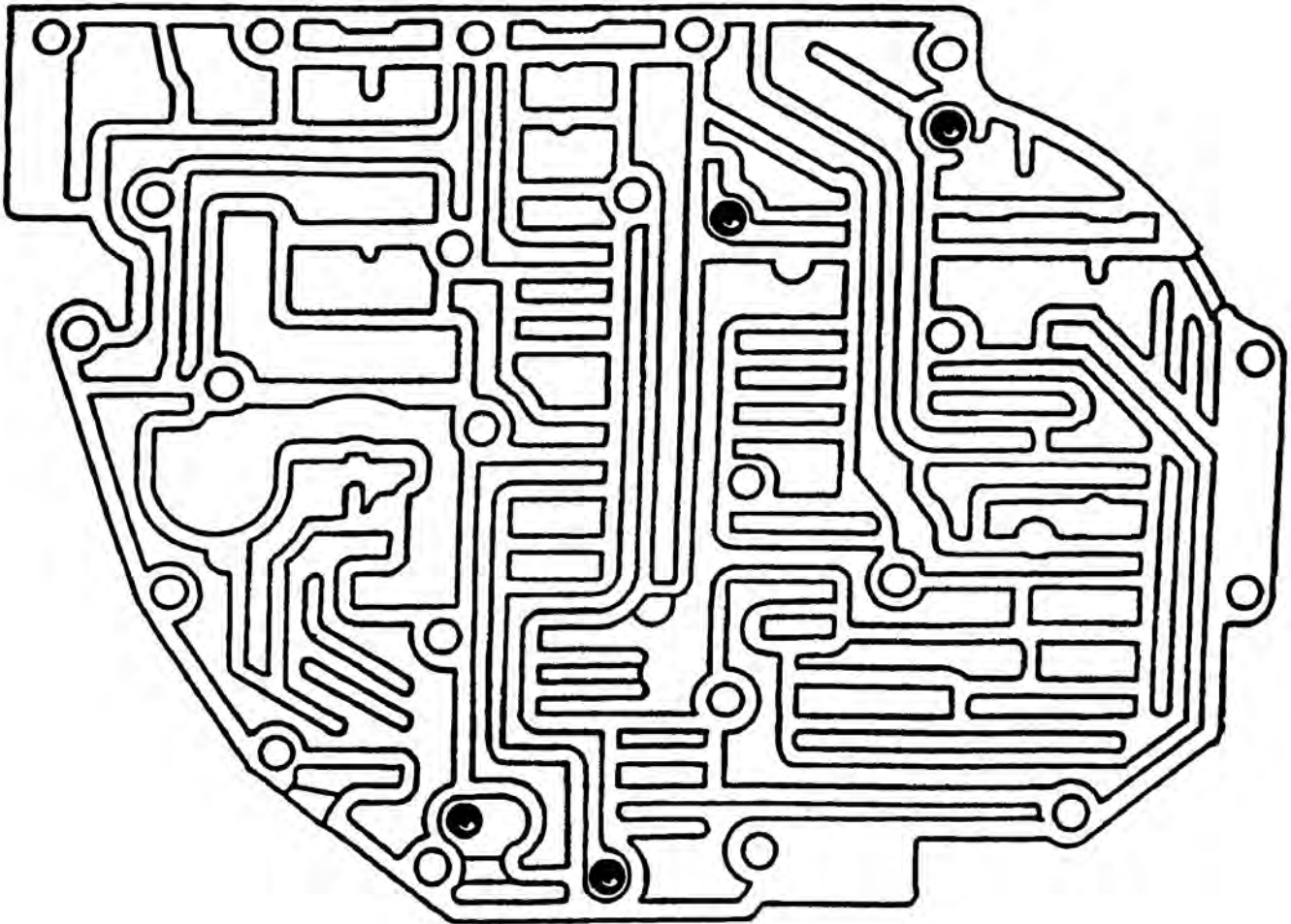
NO. 8 1996-UP
(Plastic Ball)

Copyright © 2002 ATSG

Figure 33

AUTOMATIC TRANSMISSION SERVICE GROUP

1989-1991 VALVE BODY CHECKBALL LOCATIONS FOR VALVE BODY CASTING NO. 4446639

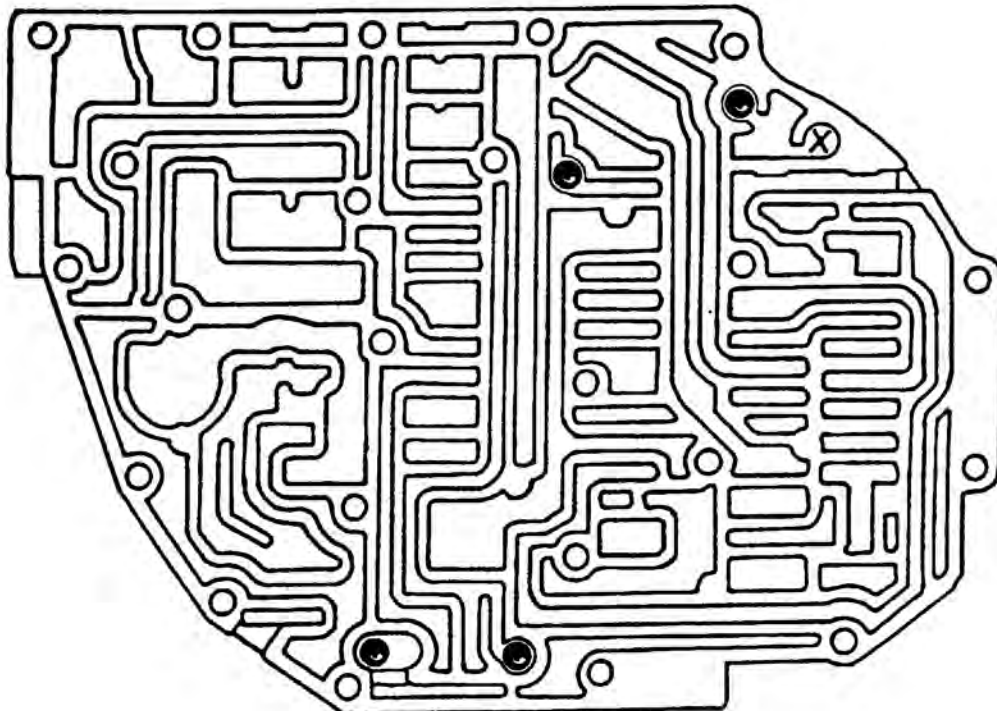


REQUIRES "FOUR" CHECKBALLS IN THE LOCATIONS SHOWN ABOVE.

Copyright © 2002 ATSG

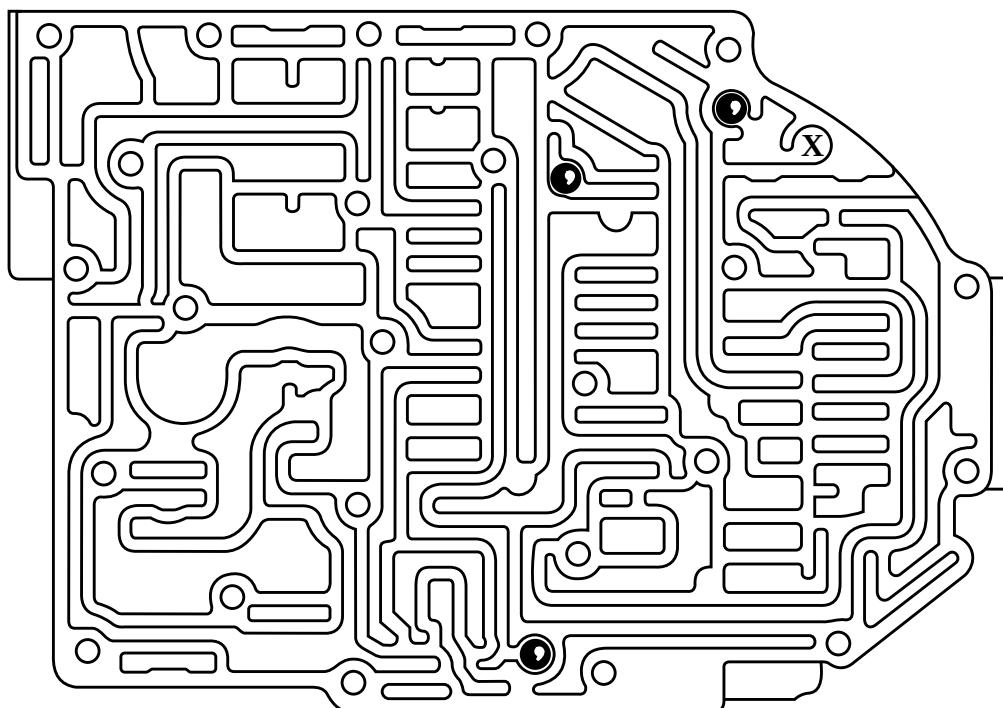
Figure 34

1992-1994 VALVE BODY CHECKBALL LOCATIONS FOR VALVE BODY CASTING NO. 4511644



REQUIRES "FOUR" CHECKBALLS IN THE LOCATIONS SHOWN ABOVE.

1995-UP VALVE BODY CHECKBALL LOCATIONS

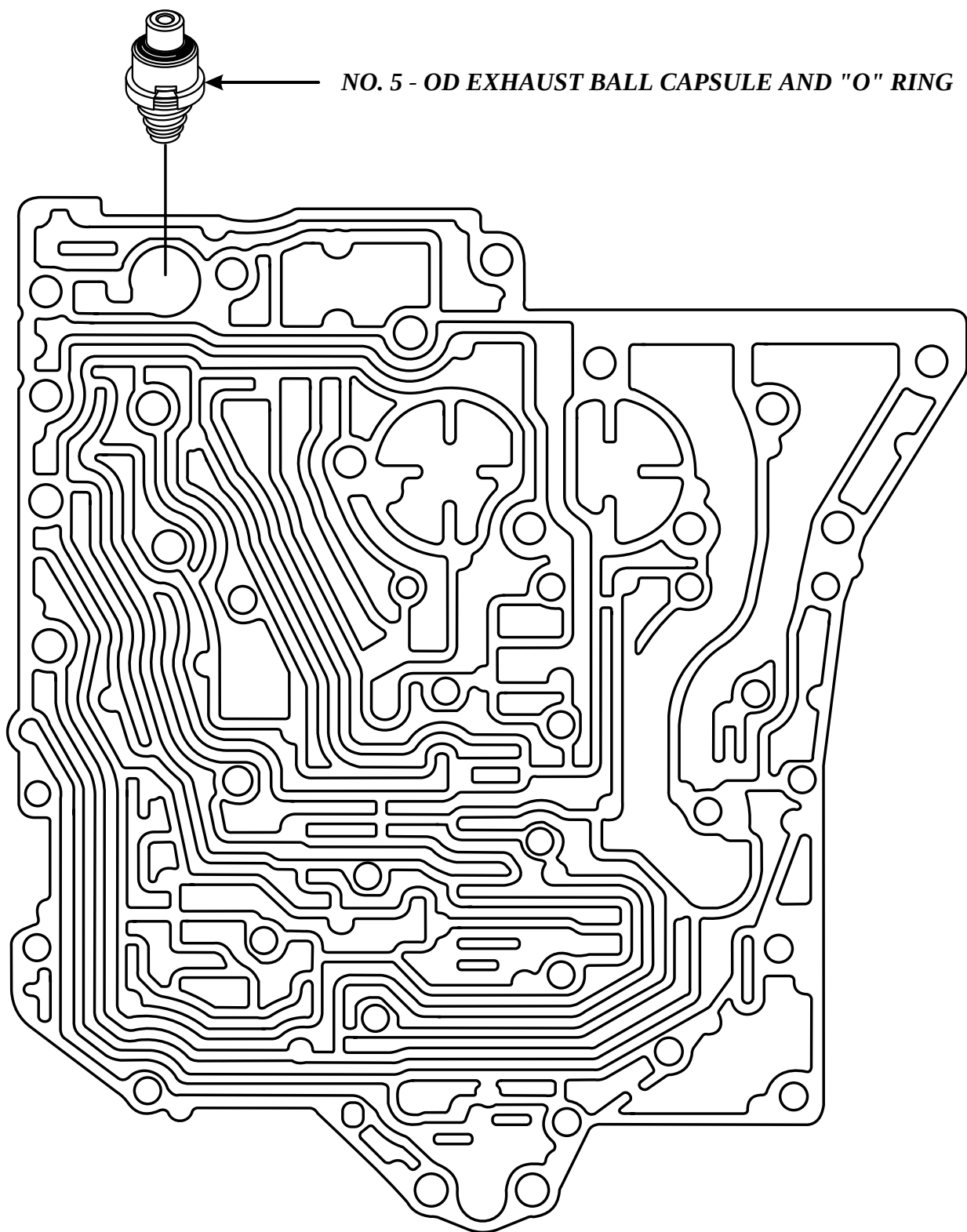


REQUIRES "THREE" CHECKBALLS IN THE LOCATIONS SHOWN ABOVE.

Copyright © 2002 ATSG

Figure 35

A604 TRANSFER PLATE (ALL YEARS)

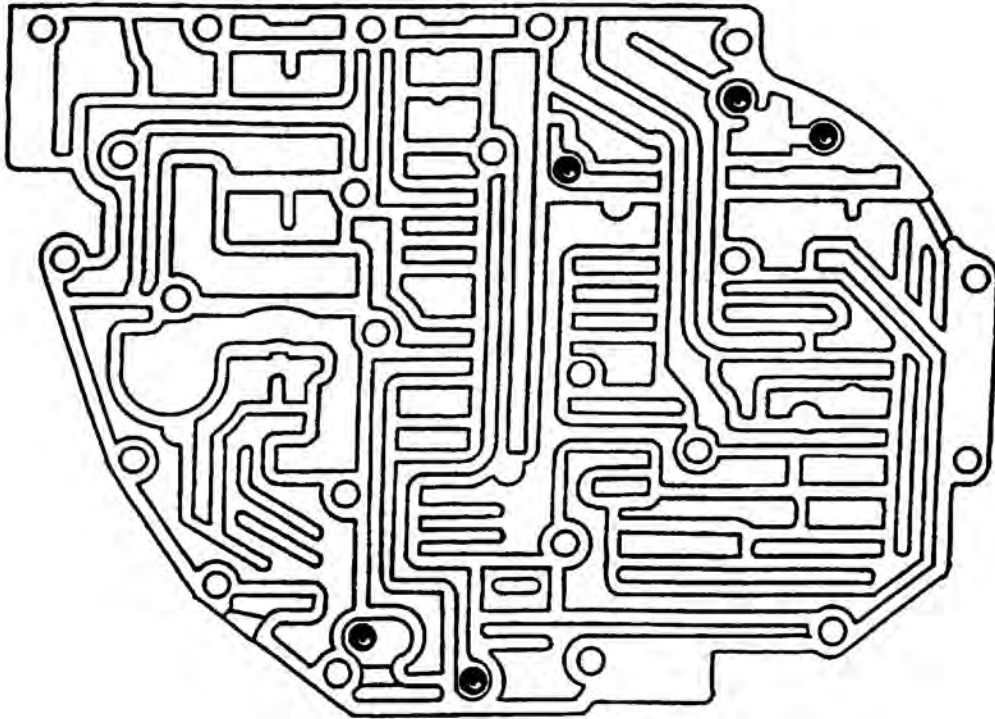


Copyright © 2002 ATSG

Figure 36

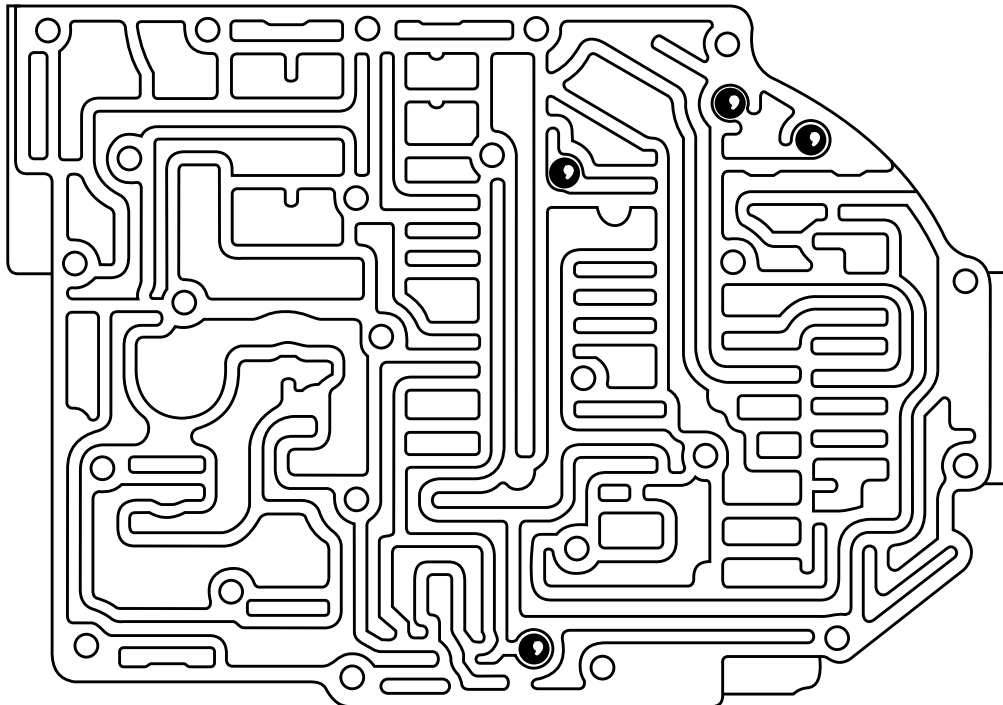
AUTOMATIC TRANSMISSION SERVICE GROUP

**CHRYSLER 42LE (A606)
1993 AND 1994 ONLY**



REQUIRES "FIVE" CHECKBALLS IN THE LOCATIONS SHOWN ABOVE.

**CHRYSLER 42LE (A606)
1995 TO CURRENT**



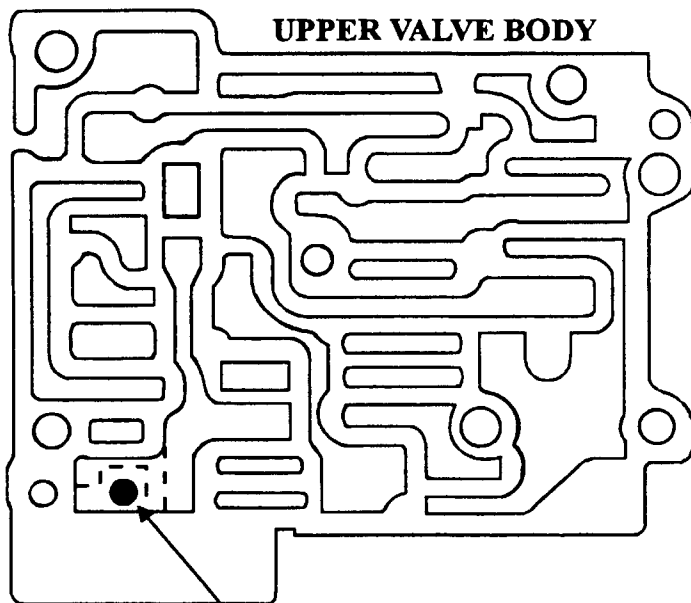
REQUIRES "FOUR" CHECKBALLS IN THE LOCATIONS SHOWN ABOVE.

Copyright © 2002 ATSG

Figure 37

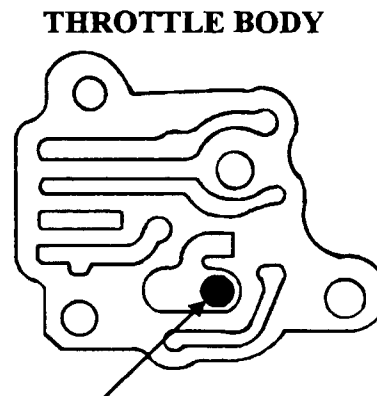
FORD FMX TRANSMISSION

VALVE BODY CHECKBALL LOCATIONS



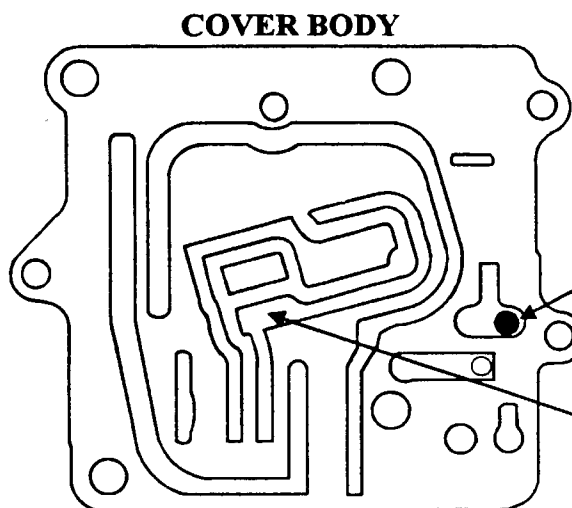
UPPER VALVE BODY

.118" STEEL CHECK BALL



THROTTLE BODY

.250" STEEL CHECK BALL



COVER BODY

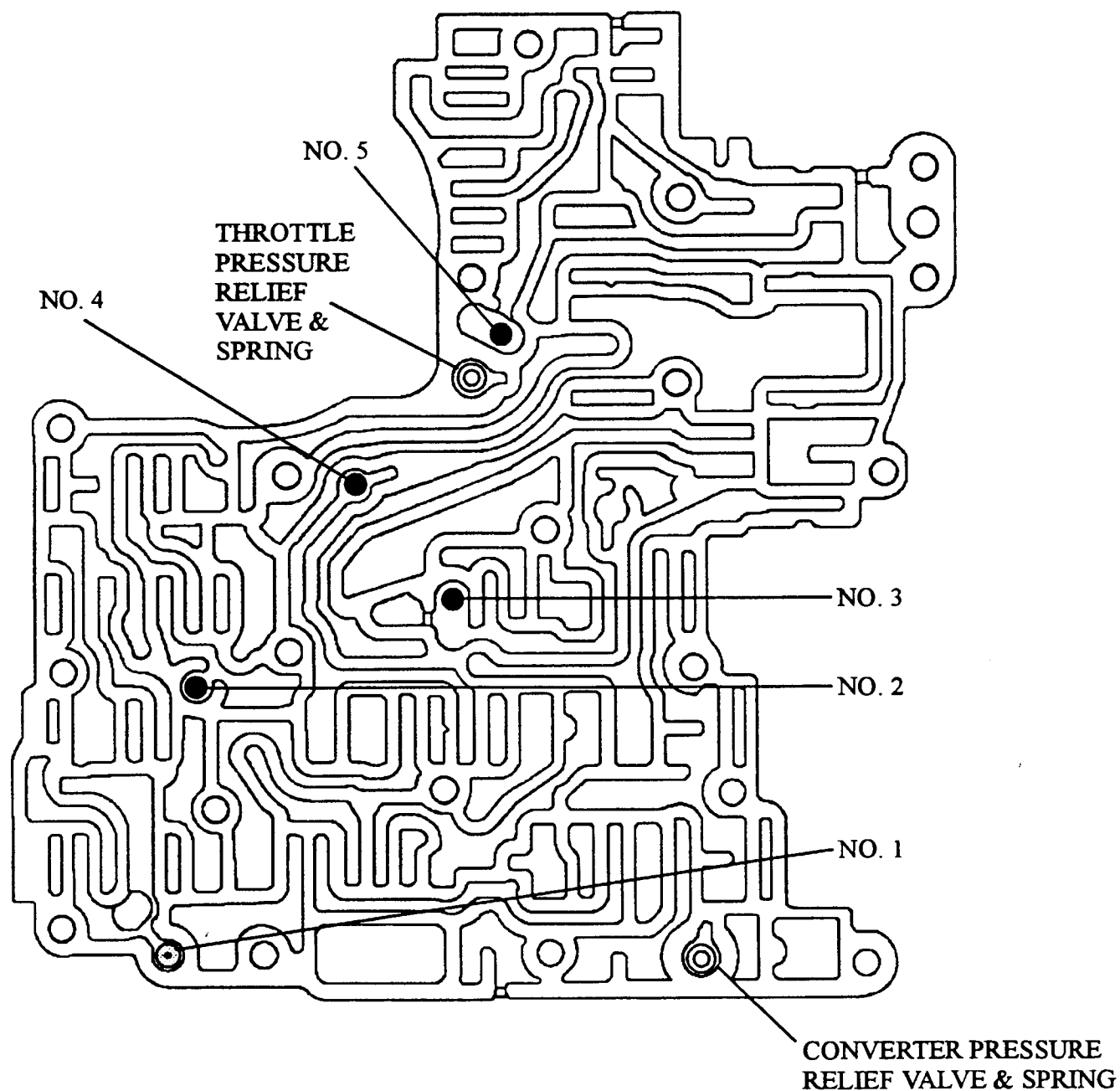
.250" STEEL CHECK BALL
**NOTE: ONLY USED WHEN A
 3-2 KICK DOWN CONTROL
 VALVE IS IN THE COVER BODY**

Look for 3-2 kickdown control ball here.

Figure 38

FORD C-3 TRANSMISSION

1973-1979 VALVE BODY CHECKBALL LOCATIONS

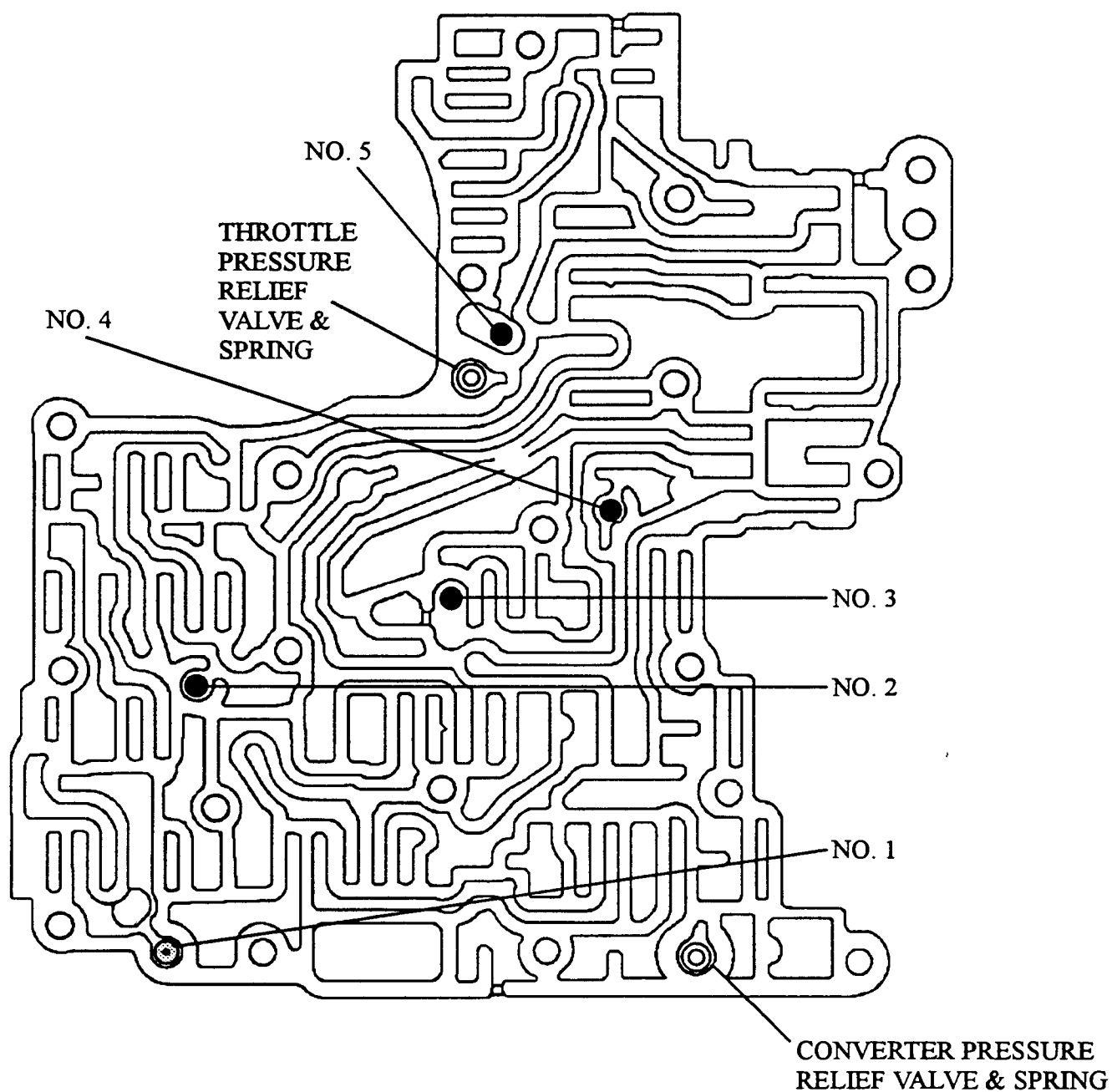


- NO. 1 INTERMEDIATE SERVO RELEASE PUCK
- NO. 2 DIRECT CLUTCH CONTROL AND EXHAUST BALL (3rd & REV)
- NO. 3 REVERSE/MANUAL 2 AND MANUAL 1 DIRECTIONAL CONTROL BALL
- NO. 4 DIRECT CLUTCH CONTROL BALL - REVERSE ONLY
- NO. 5 TV COAST & BOOST CONTROL BALL

Figure 39

FORD C-3 TRANSMISSION

1980-1986 VALVE BODY CHECKBALL LOCATIONS



- NO. 1 INTERMEDIATE SERVO RELEASE PUCK
- NO. 2 DIRECT CLUTCH CONTROL AND EXHAUST BALL (3rd & REV)
- NO. 3 REVERSE/MANUAL 2 AND MANUAL 1 DIRECTIONAL CONTROL BALL
- NO. 4 DIRECT CLUTCH CONTROL BALL - REVERSE ONLY
- NO. 5 TV COAST & BOOST CONTROL BALL

Figure 40

FORD C-4 TRANSMISSION
UPPER VALVE BODY CHECKBALL LOCATIONS
(1971 & UP)

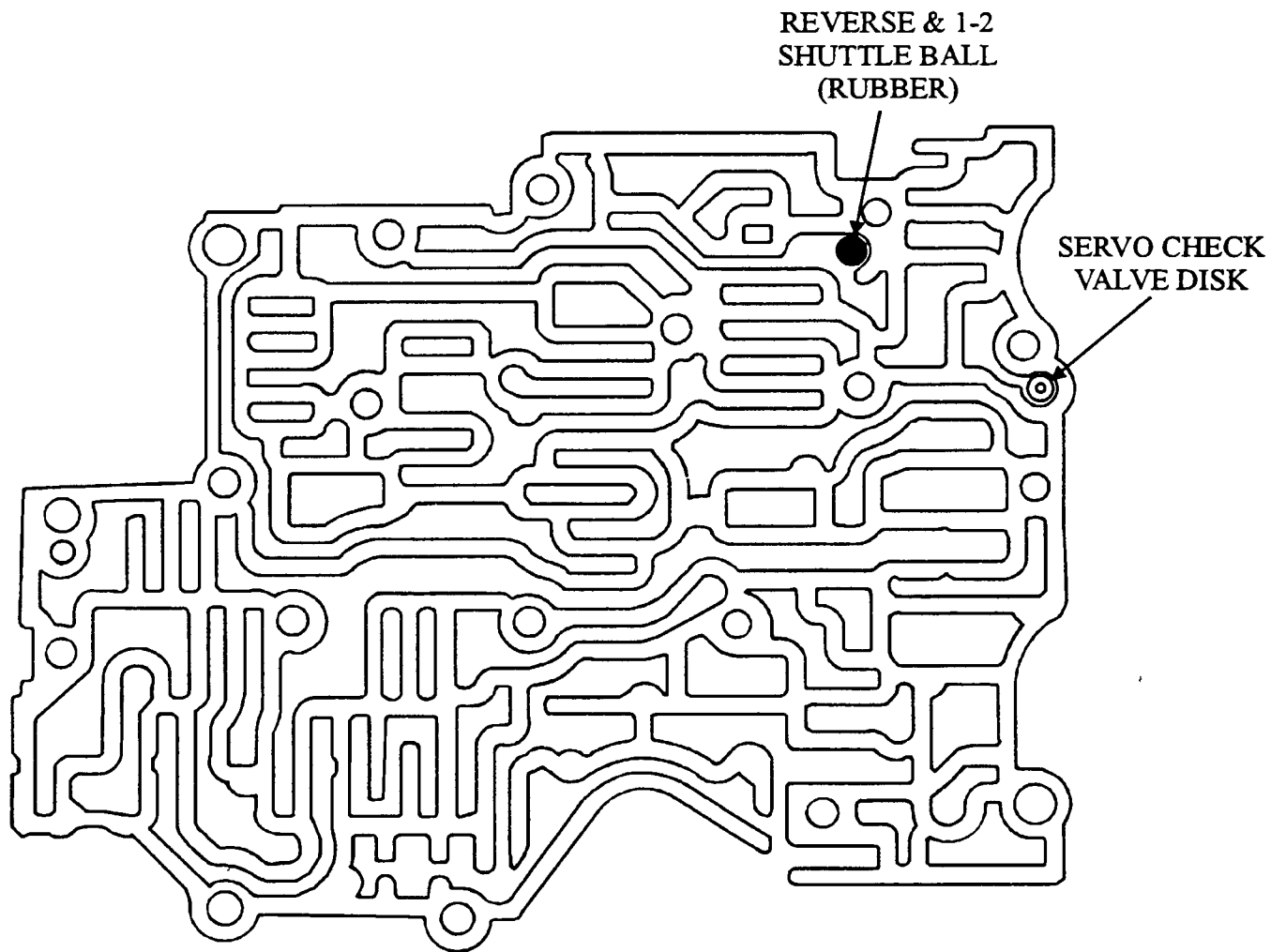
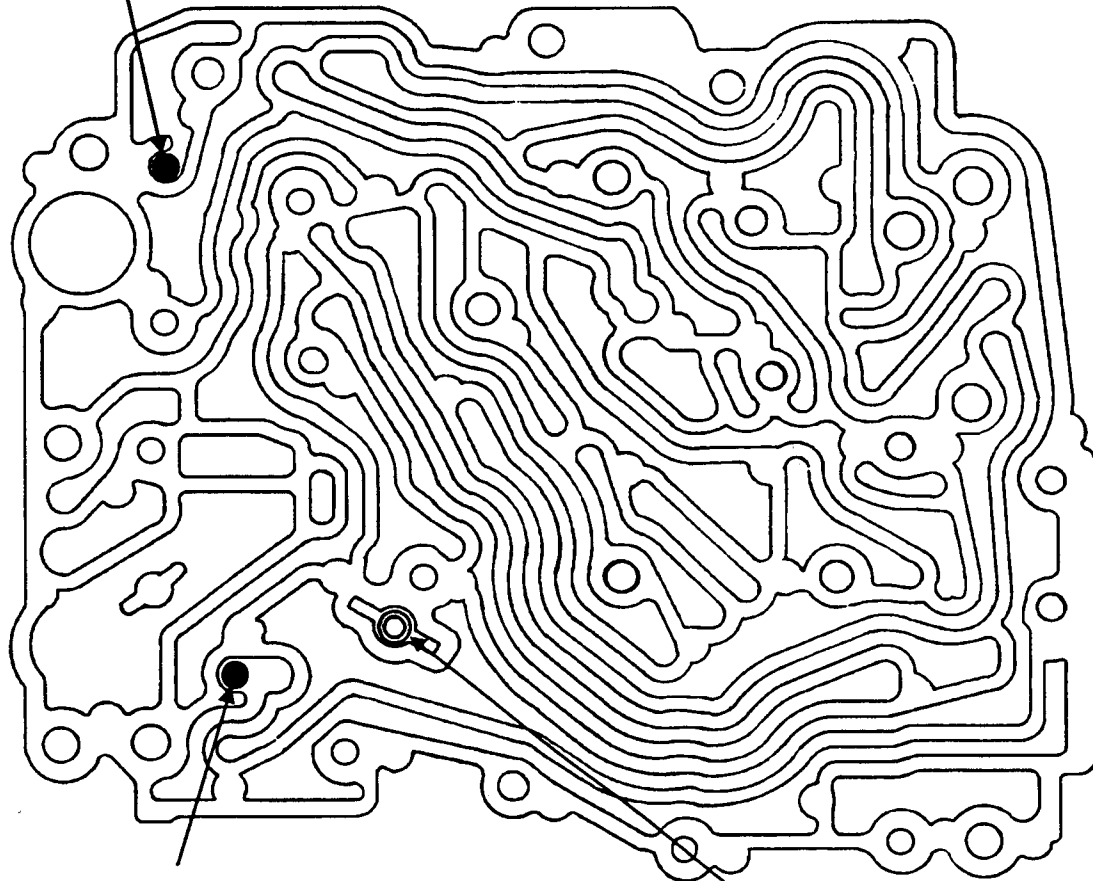


Figure 41

FORD C-4 TRANSMISSION
LOWER VALVE BODY CHECKBALL LOCATIONS
(1971 & UP)

HIGH SPEED KICK DOWN
SHUTTLE VALVE BALL



2-1 REVERSE CUTBACK
TV SHUTTLE VALVE BALL

TV PRESSURE LIMIT
VALVE & SPRING

Figure 42

FORD C-5 TRANSMISSION

UPPER & TIMING VALVE BODY CHECKBALL LOCATIONS

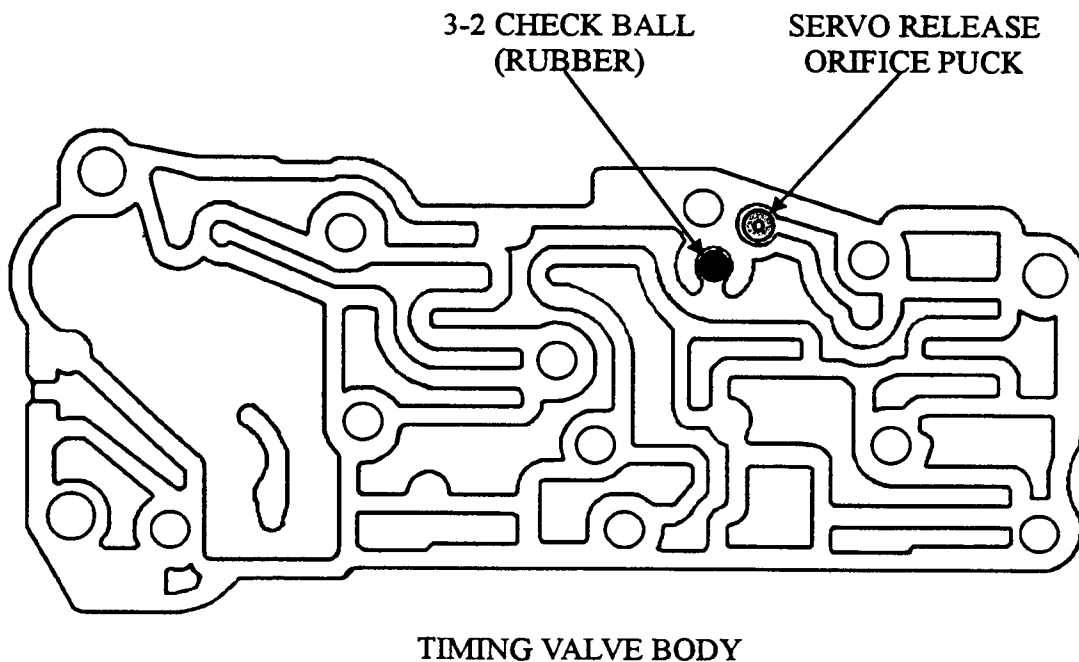
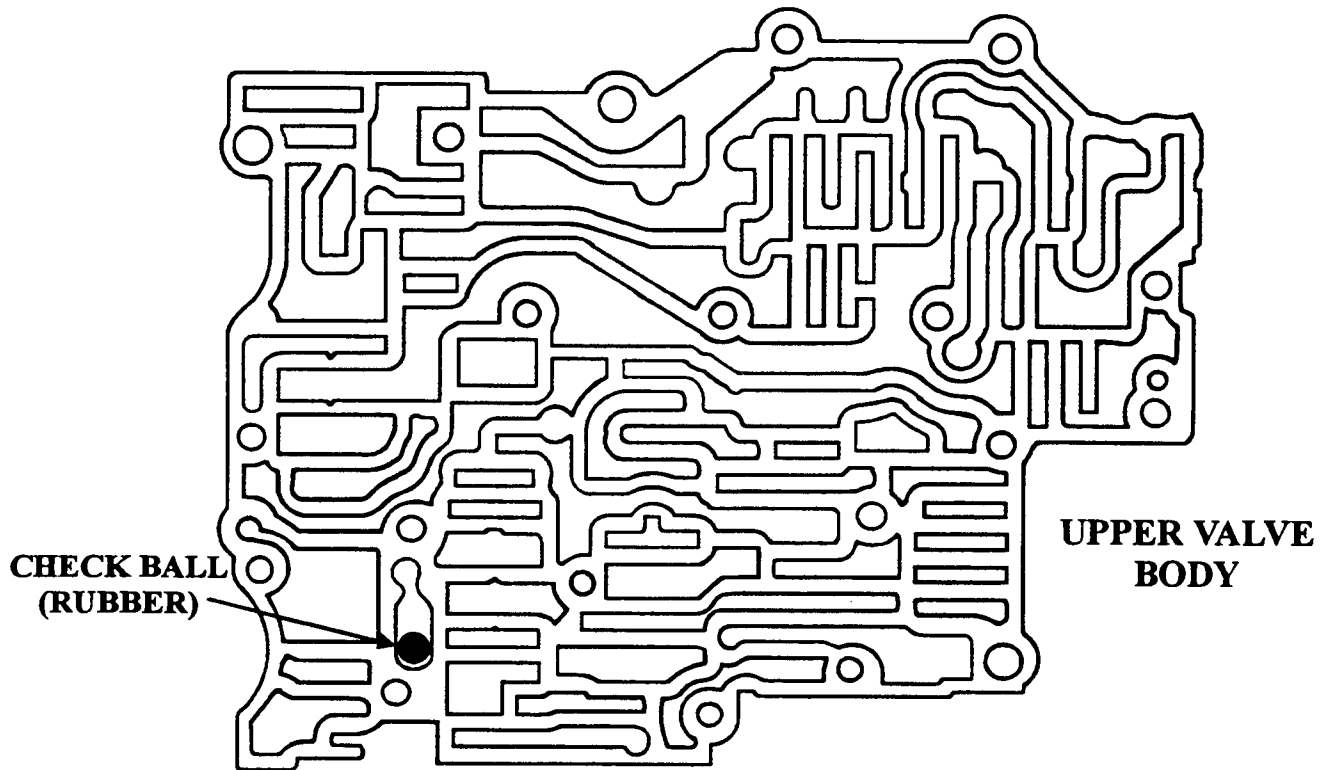


Figure 43

FORD C-5 TRANSMISSION

LOWER VALVE BODY (Bottom & Upper View) CHECKBALL LOCATIONS

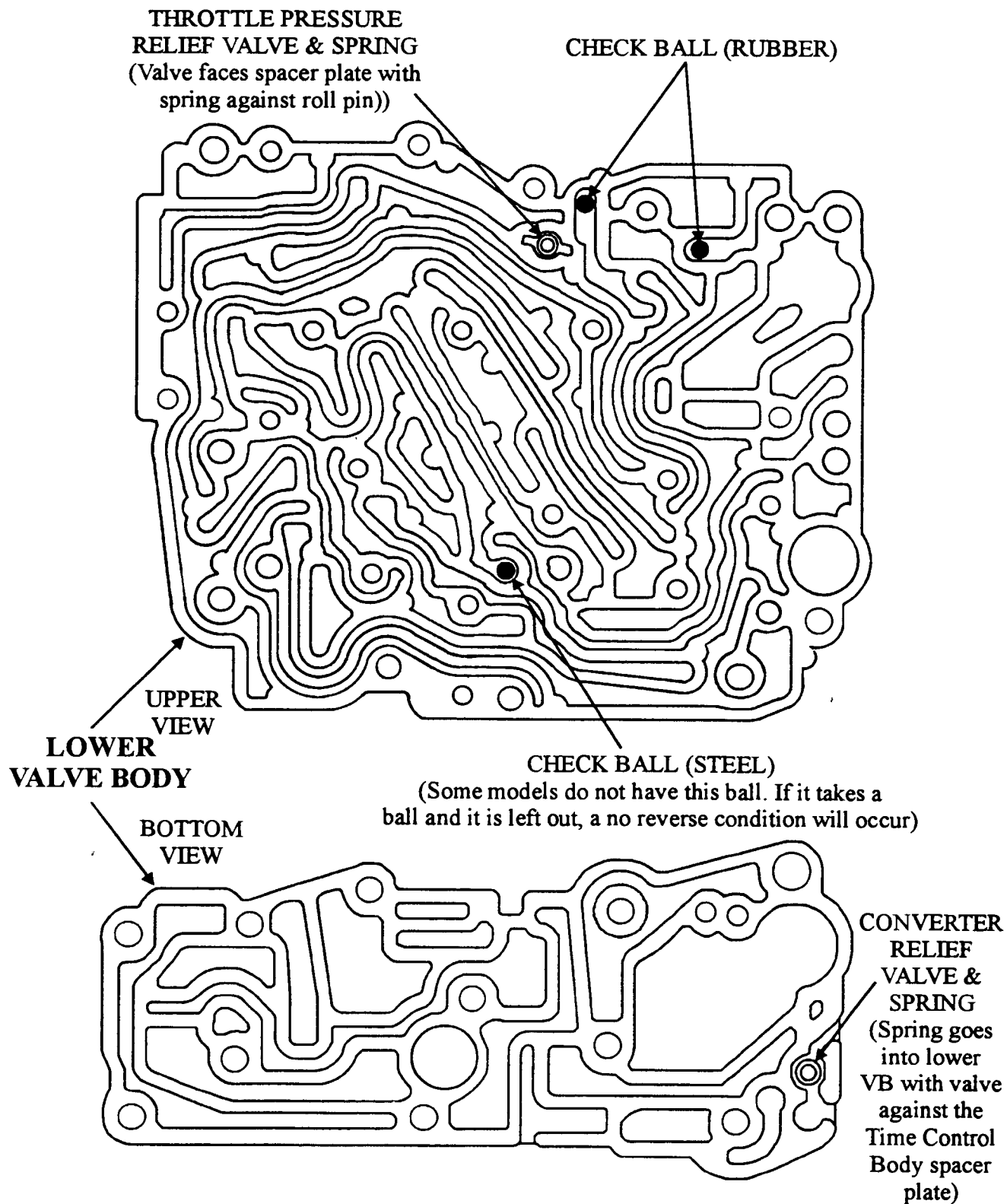
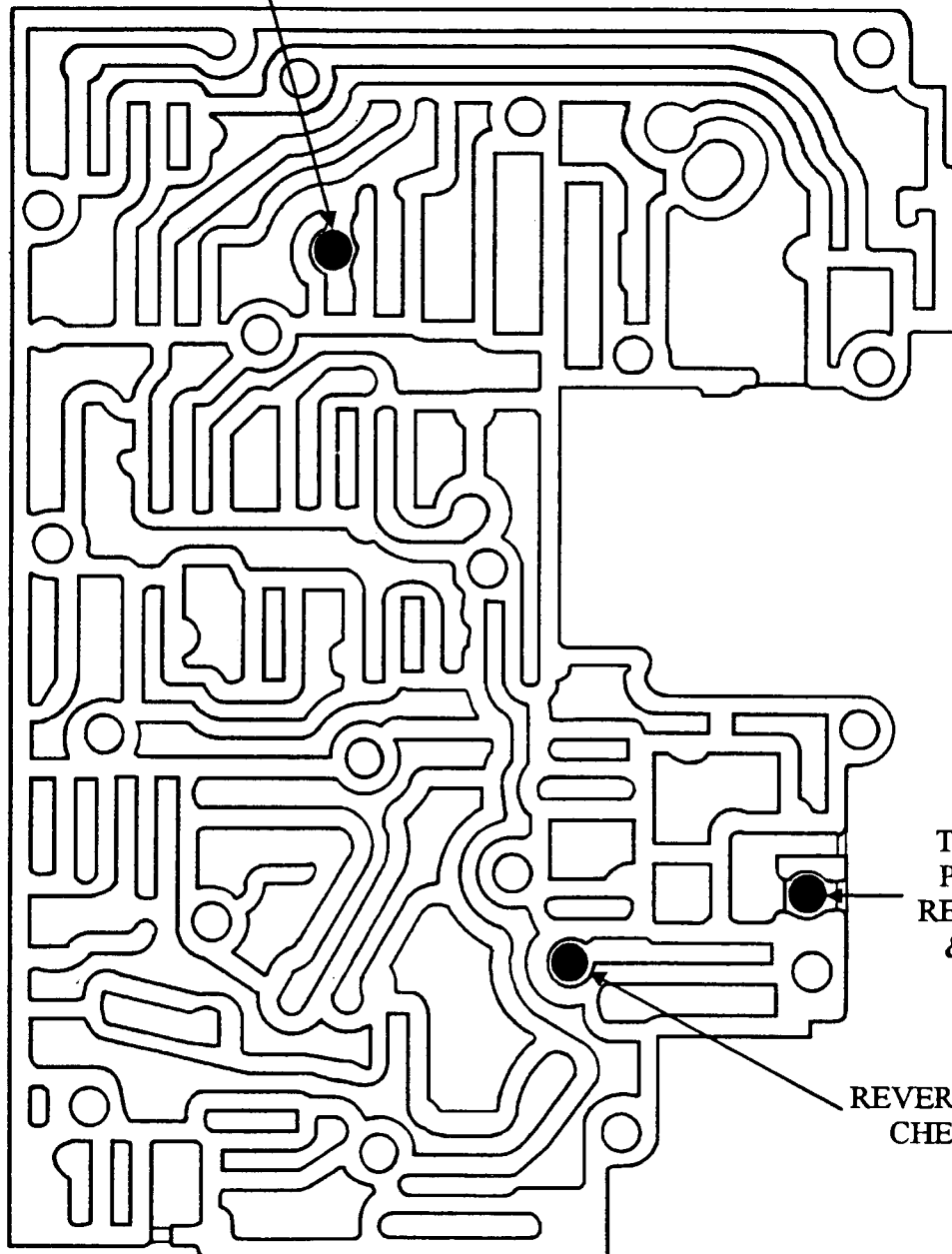


Figure 44

FORD C-6 TRANSMISSION
MAIN VALVE BODY CHECKBALL LOCATIONS

2-3 SHIFT CHECK VALVE BALL



THROTTLE
PRESSURE
RELIEF BALL
& SPRING

REVERSE CLUTCH
CHECK BALL

Figure 45

FORD A4LD TRANSMISSION

SINGLE SOLENOID MAIN VALVE BODY CHECKBALL LOCATIONS

SCORPIO/MERCUR ONLY

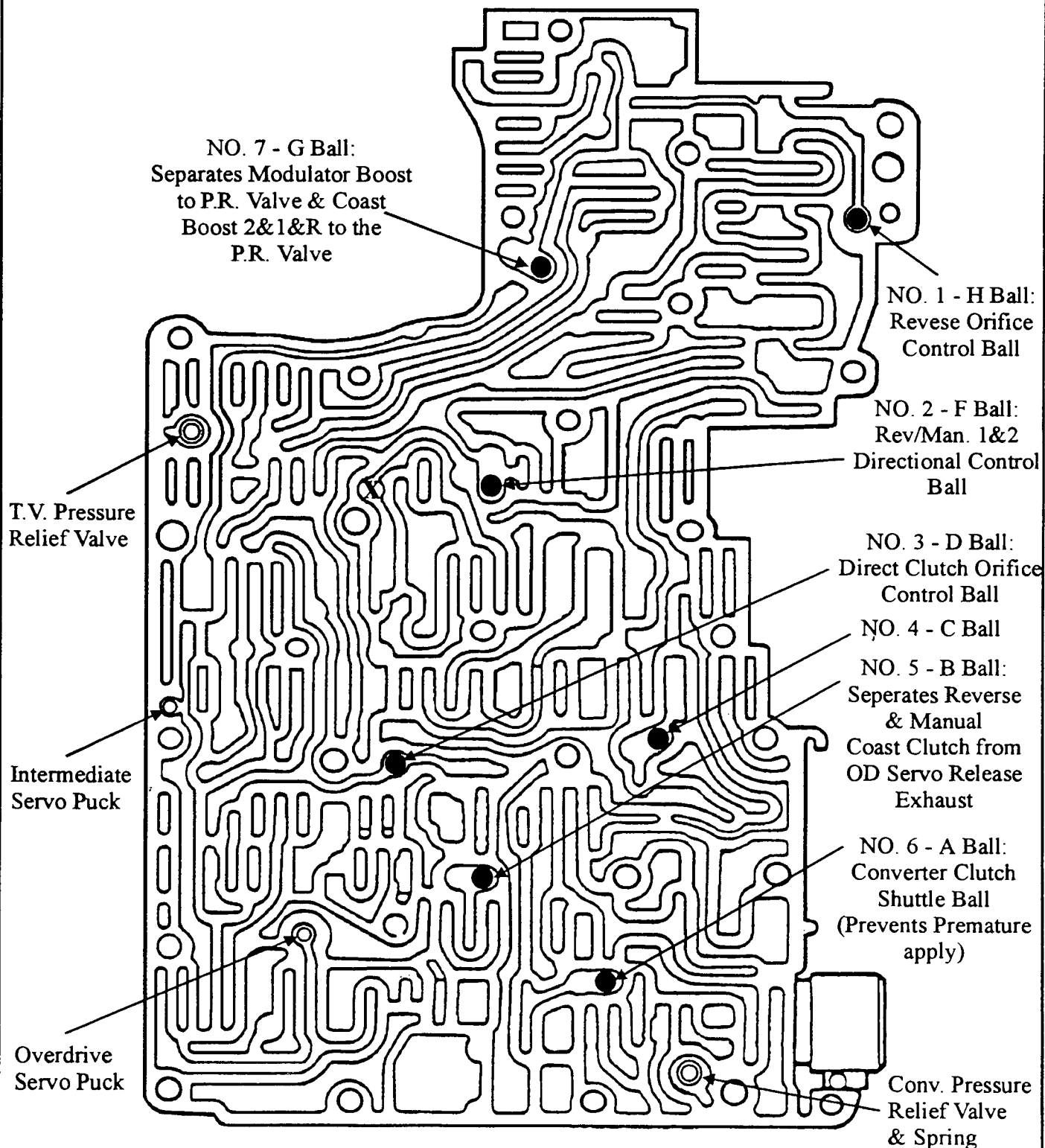


Figure 46

FORD A4LD TRANSMISSION

SINGLE SOLENOID MAIN VALVE BODY CHECKBALL LOCATIONS
ALL MODELS EXCEPT SCORPIO/MERCUR

ProCarManuals.com

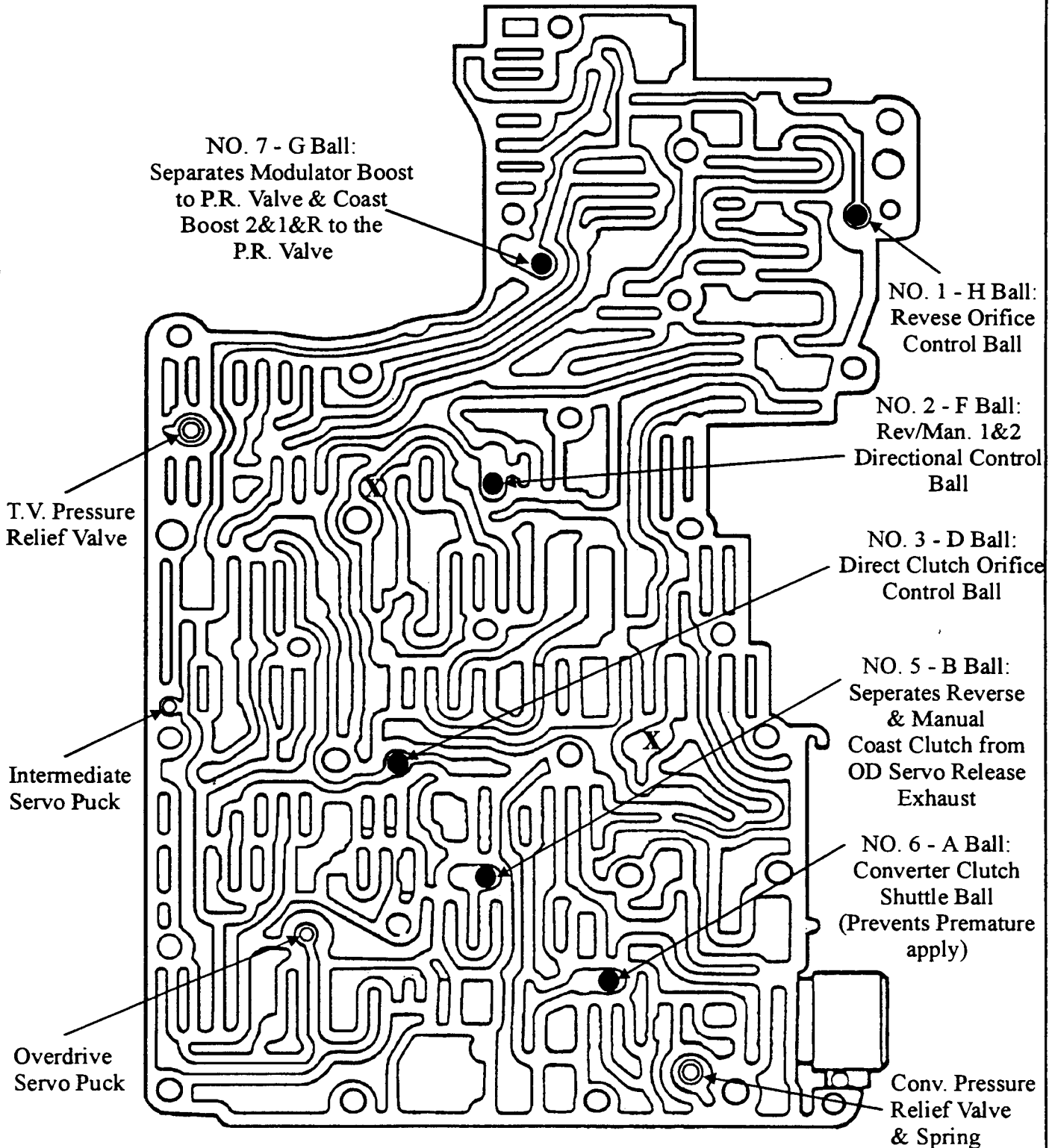


Figure 47

FORD A4LD TRANSMISSION

DOUBLE SOLENOID MAIN VALVE BODY CHECKBALL LOCATIONS WITHOUT REVERSE ENGAGEMENT CONTROL VALE

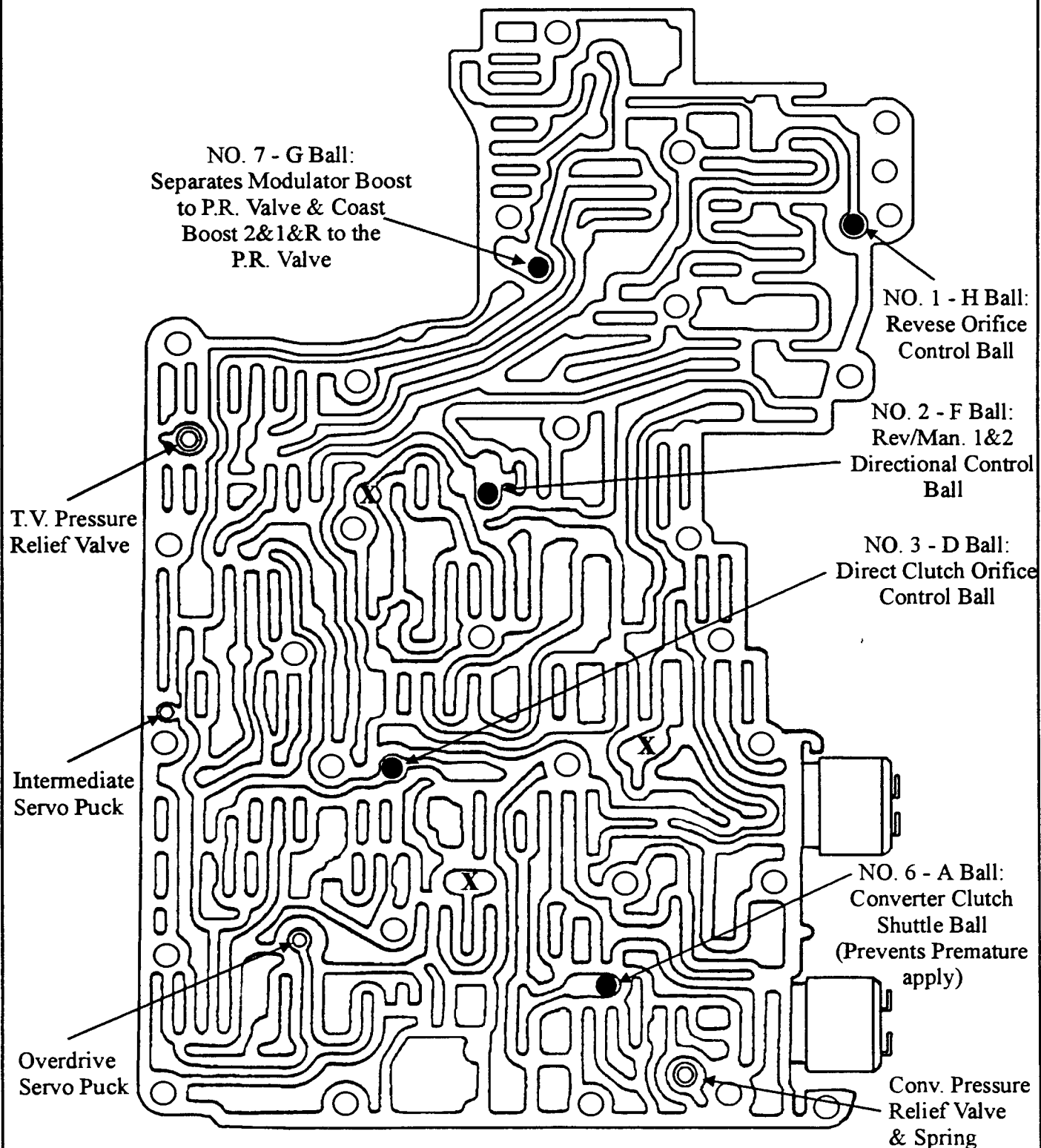


Figure 48

FORD A4LD TRANSMISSION

**DOUBLE SOLENOID MAIN VALVE BODY CHECKBALL LOCATIONS
WITH REVERSE ENGAGEMENT CONTROL VALE**

ProCarManuals.com

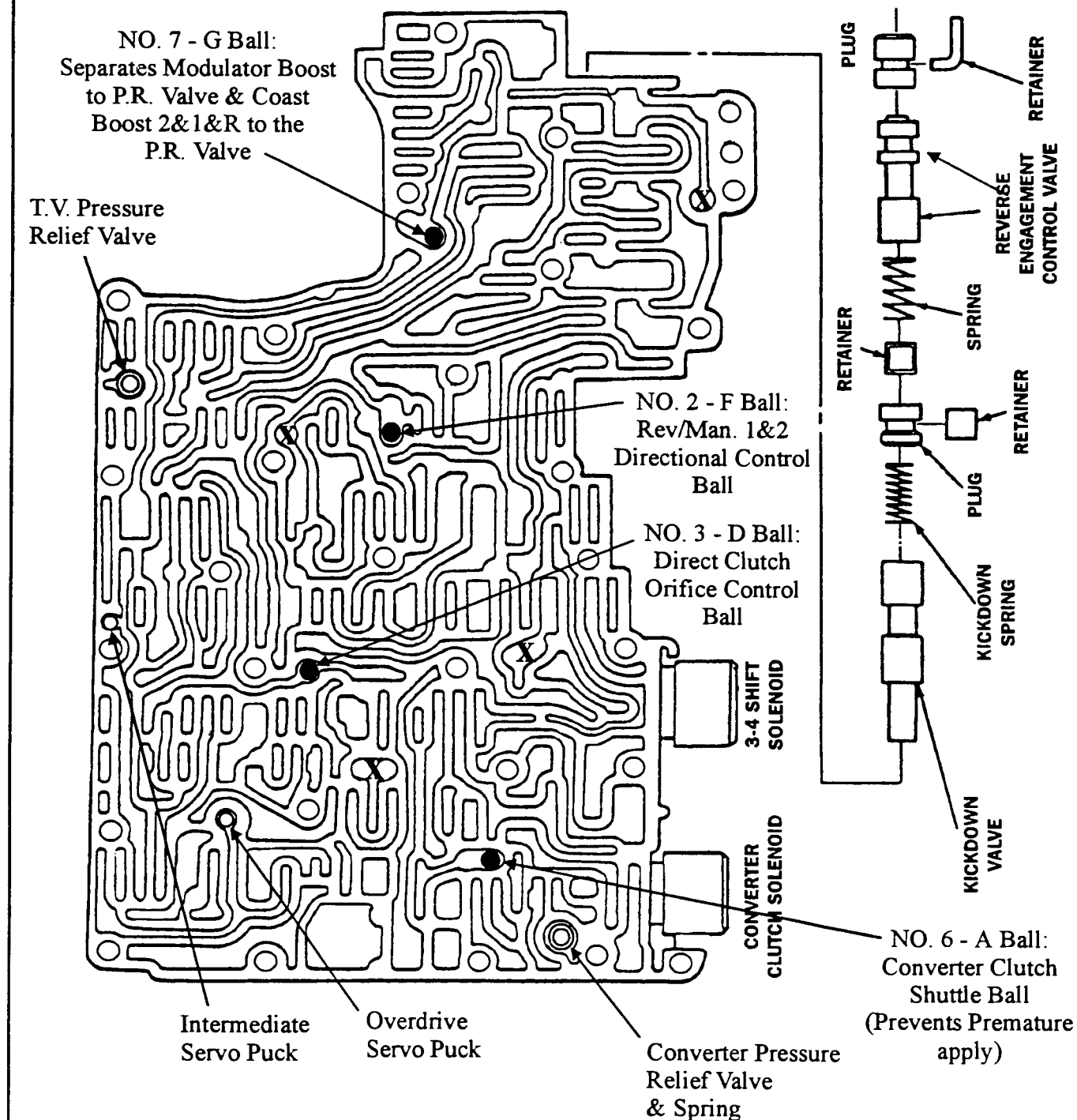


Figure 49

FORD A4R44/55-E TRANSMISSION

MAIN VALVE BODY CHECKBALL LOCATIONS

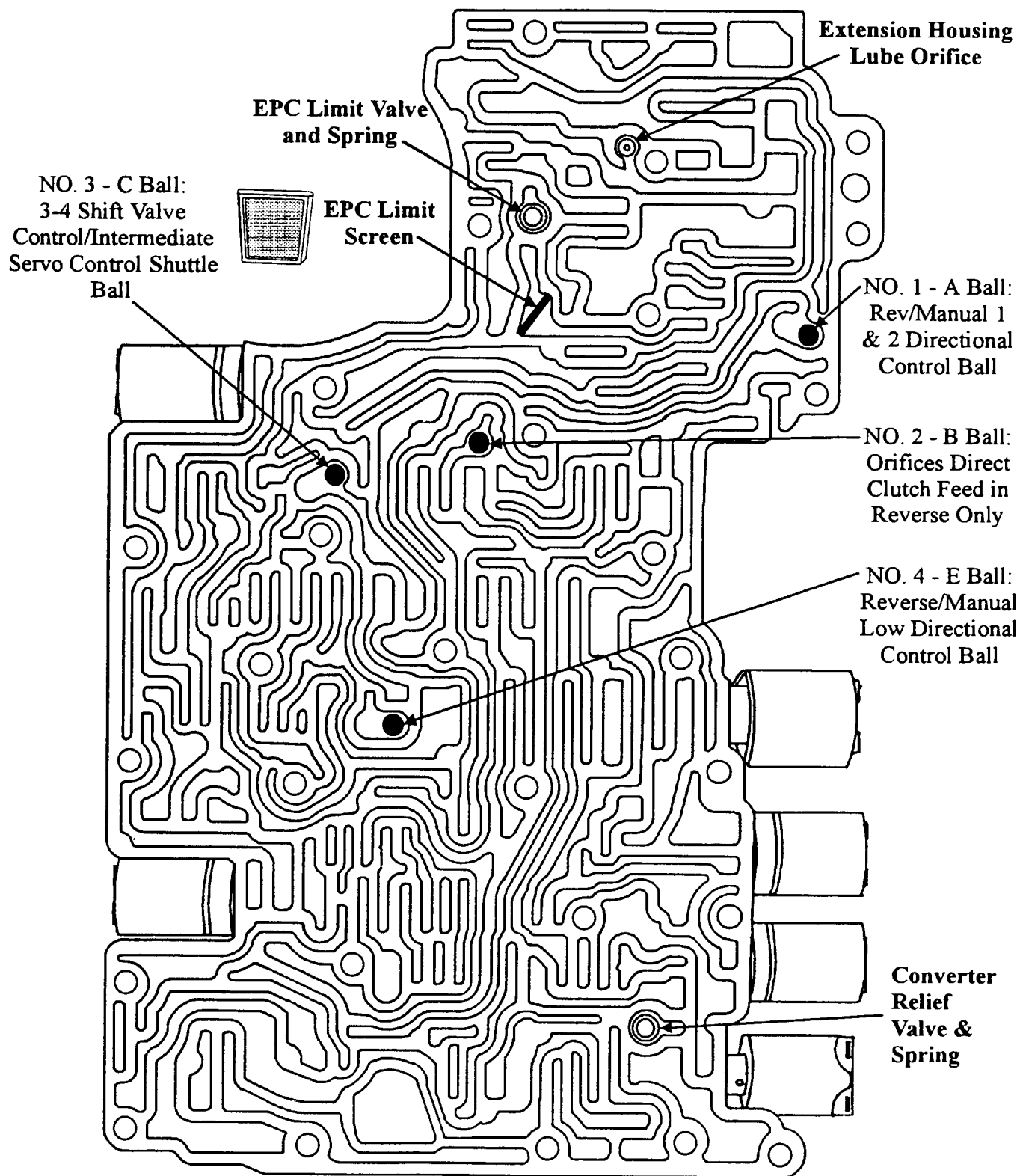
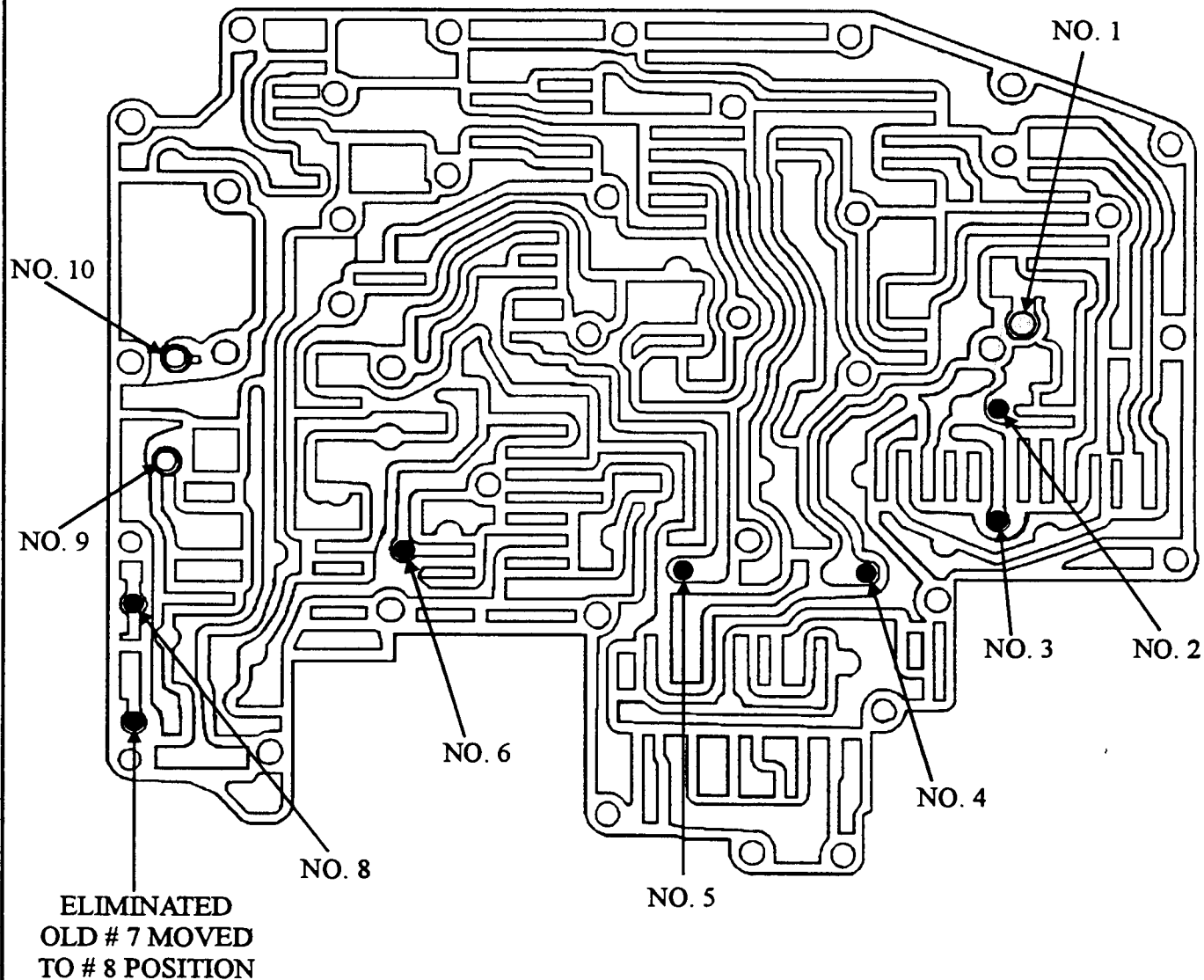


Figure 50

FORD AOD TRANSMISSION

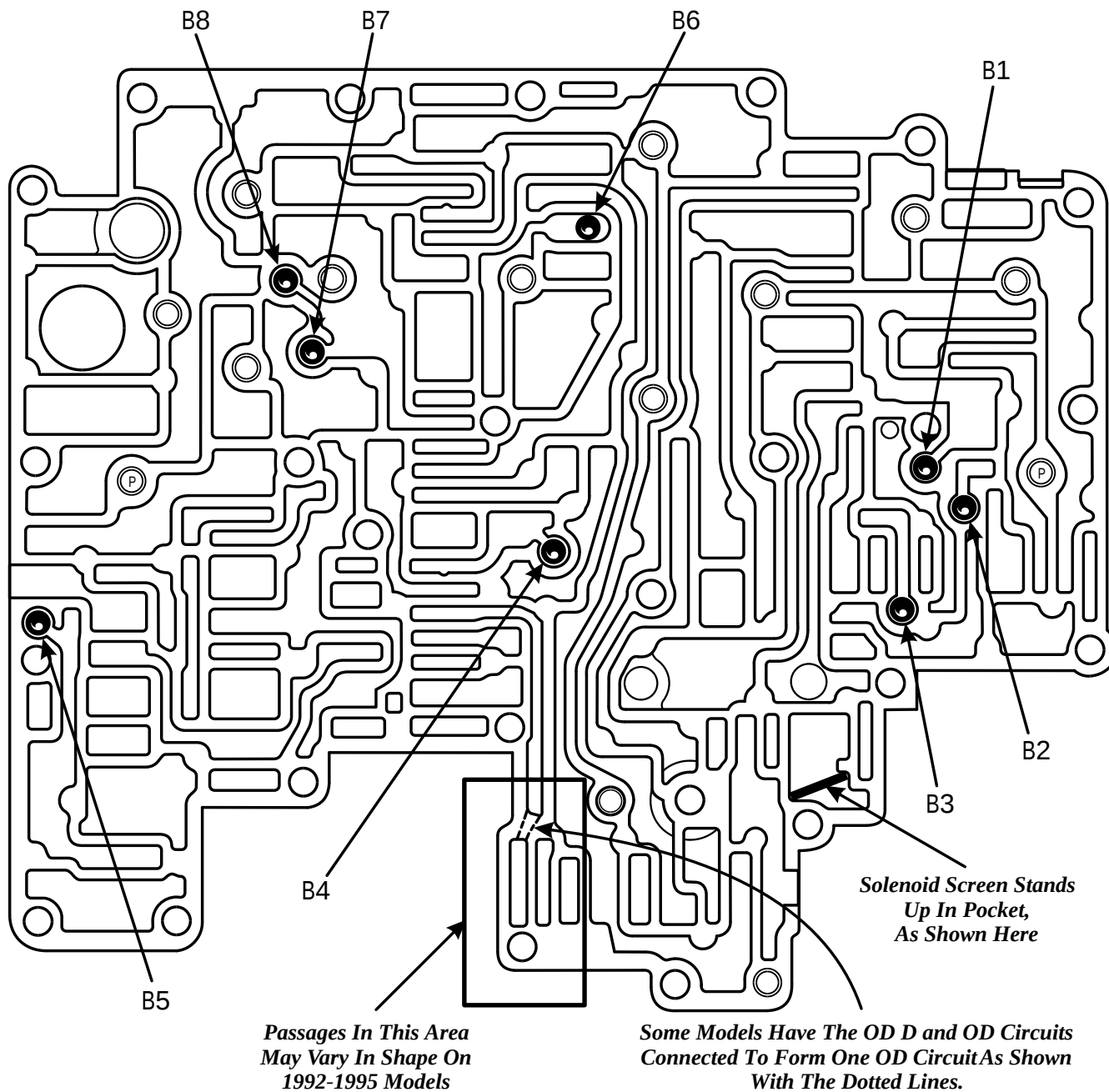
MAIN VALVE BODY CHECKBALL LOCATIONS



- NO. 1 FORWARD CLUTCH TIME CONTROL & EXHAUST BALL (4-3 KD - .310" Orange)
- NO. 2 2-3 ACCUMULATOR TIME CONTROL & EXHAUST BALL
- NO. 3 2-3 ORIFICE K CONTROL BALL
- NO. 4 PARK, REVERSE, MANUAL 3,2,1 & KD SHUTTLE BALL
- NO. 5 PARK, REVERSE, MANUAL 2,1 & KD SHUTTLE BALL
- NO. 6 3-4 EXHAUST CONTROL BALL
- NO. 8 3-4 ACCUMULATOR SHOULDER PRESSURE ORIFICE CONTROL BALL
- NO. 9 CONVERTER PRESSURE RELIEF VALVE
- NO. 10 T.V. PRESSURE RELIEF VALVE

Figure 51

1992-1995 AODE/4R70W CHECKBALL LOCATIONS



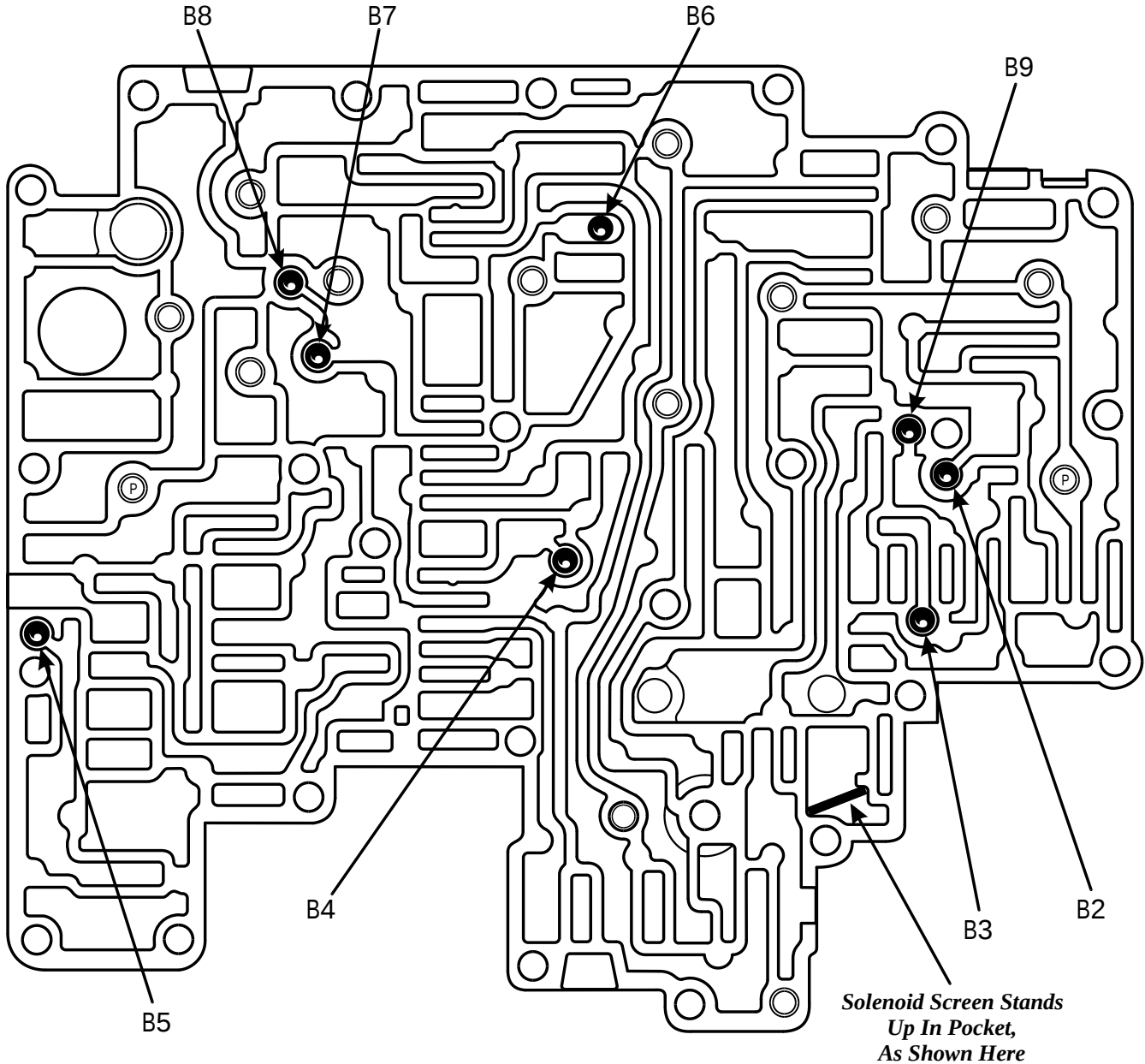
- B1 - Between the Forward Clutch circuit and the 23BP circuit (92-95 Only).
- B2 - In the Forward Clutch circuit near the 3-4 shift valve.
- B3 - In the Direct Clutch circuit near the 2-3 backout valve.
- B4 - In the Overdrive and Forward Clutch circuits near the 1-2 shift valve.
- B5 - In the Reverse circuit near orifice number one.
- B6 - Shuttle ball between the Low and Reverse circuits.
- B7 - Between the L234 and Torque Converter Clutch circuits.
- B8 - Between the L234 and Intermediate Clutch circuits.

Copyright © 2002 ATSG

Figure 52

AUTOMATIC TRANSMISSION SERVICE GROUP

1996-UP AODE/4R70W CHECKBALL LOCATIONS



- B2 - In the Forward Clutch circuit near the 3-4 shift valve.
- B3 - In the Direct Clutch circuit near the 2-3 backout valve.
- B4 - In the Overdrive and Forward Clutch circuits near the 1-2 shift valve.
- B5 - In the Reverse circuit near orifice number one.
- B6 - Shuttle ball between the Low and Reverse circuits.
- B7 - Between the L234 and Torque Converter Clutch circuits.
- B8 - Between the L234 and Intermediate Clutch circuits.
- B9 - Between the FC34 and 23BP circuits (1996-Up Only).

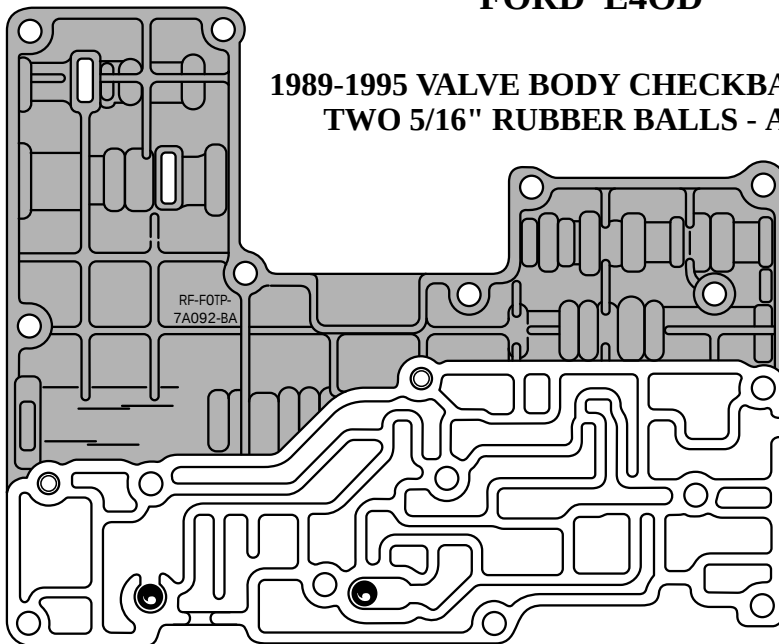
Copyright © 2002 ATSG

Figure 53

AUTOMATIC TRANSMISSION SERVICE GROUP

FORD E4OD

1989-1995 VALVE BODY CHECKBALL LOCATIONS TWO 5/16" RUBBER BALLS - ALL MODELS

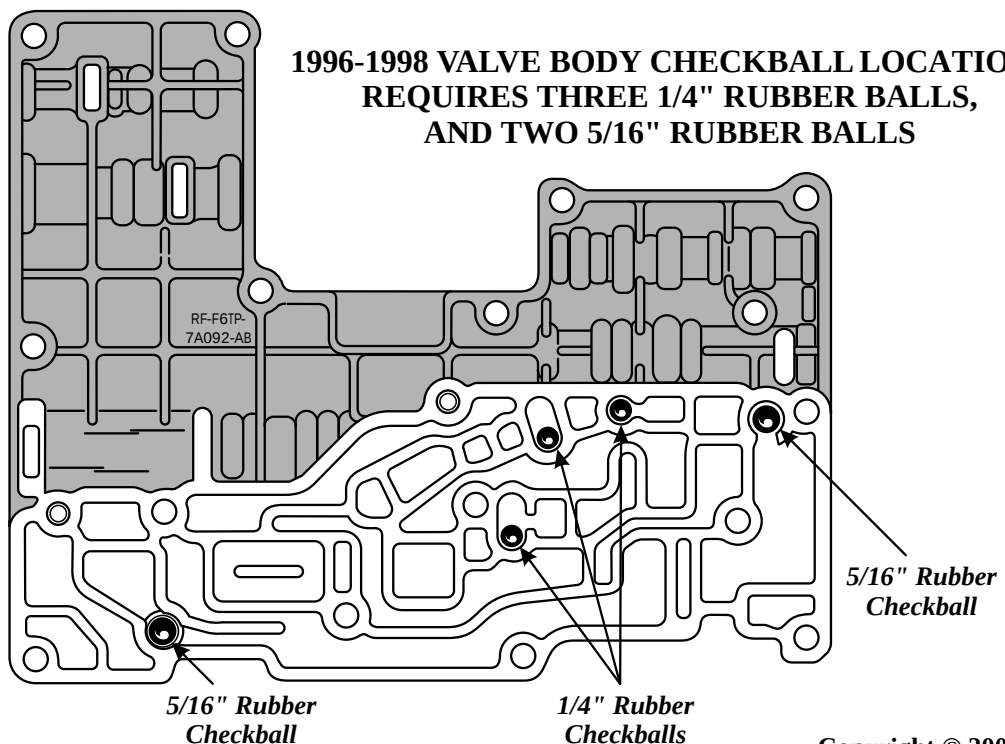


SPECIAL NOTE:

Some 1995 models were built with 1996 production valve body, spacer plate, and valve body gaskets. Be very careful to identify the parts on any 1995 model properly.

FORD E4OD

1996-1998 VALVE BODY CHECKBALL LOCATIONS REQUIRES THREE 1/4" RUBBER BALLS, AND TWO 5/16" RUBBER BALLS

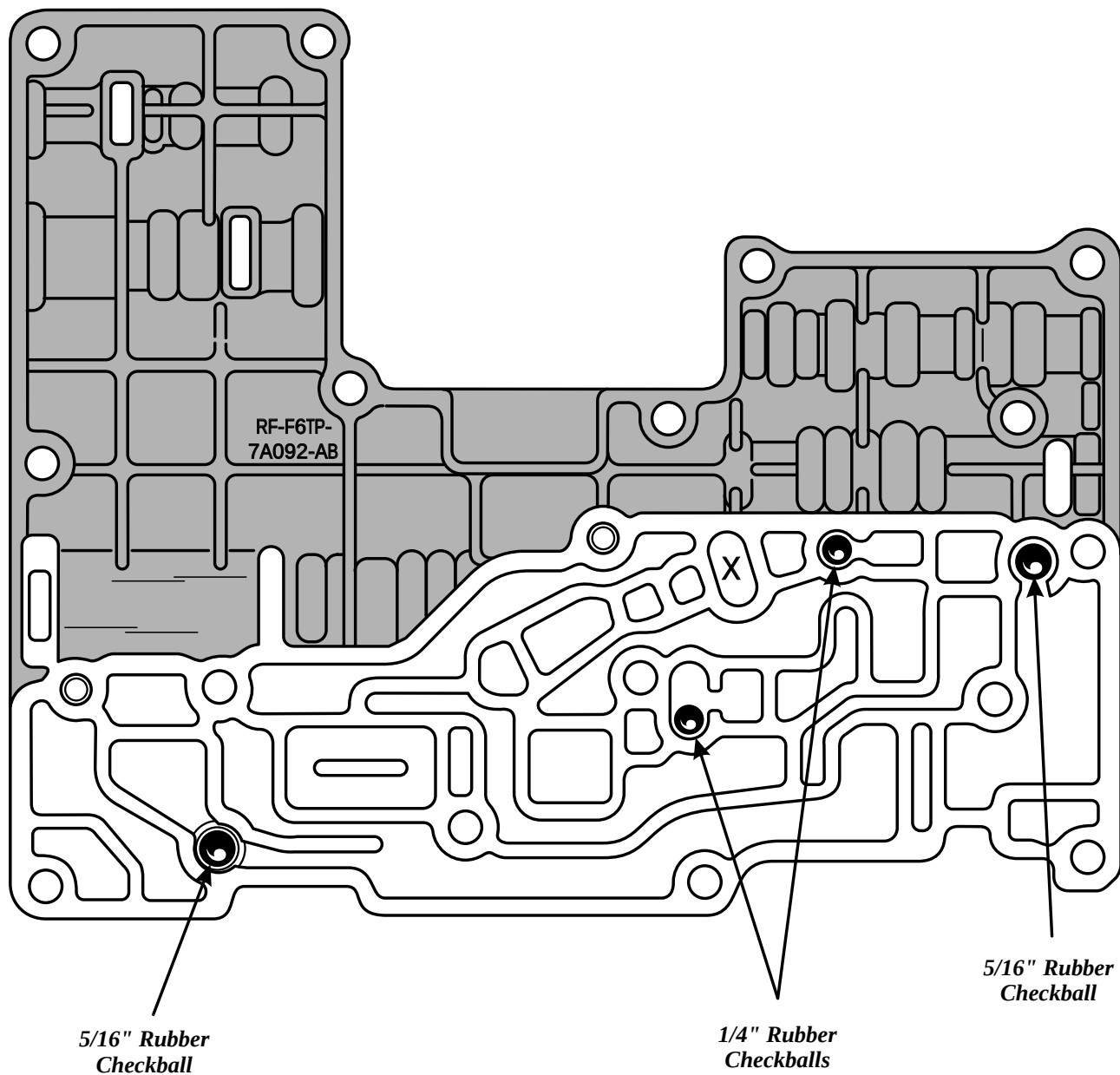


Copyright © 2002 ATSG

Figure 54

FORD 4R100

1998-2003 VALVE BODY CHECKBALL LOCATIONS
REQUIRES "TWO" 1/4" RUBBER BALLS,
AND "TWO" 5/16" RUBBER BALLS



**EARLY 1989 CASE CHECKBALL LOCATIONS
REQUIRES FOURTEEN (5/16") RUBBER BALLS**

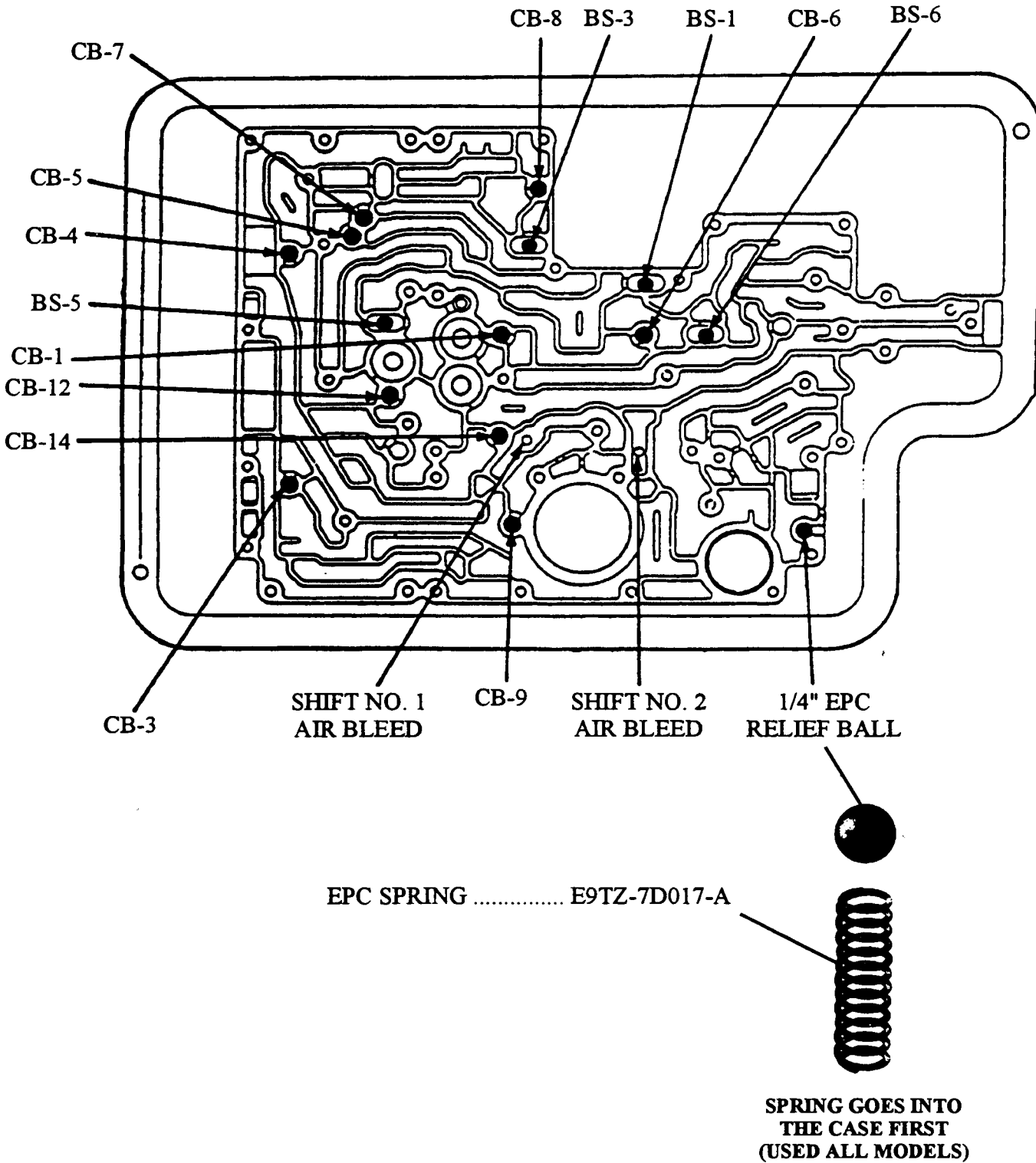


Figure 56

**LATE 1989 CASE CHECKBALL LOCATIONS
REQUIRES TEN (5/16") RUBBER BALLS AND
ONE 5/16" STEEL BALL IN CASE**

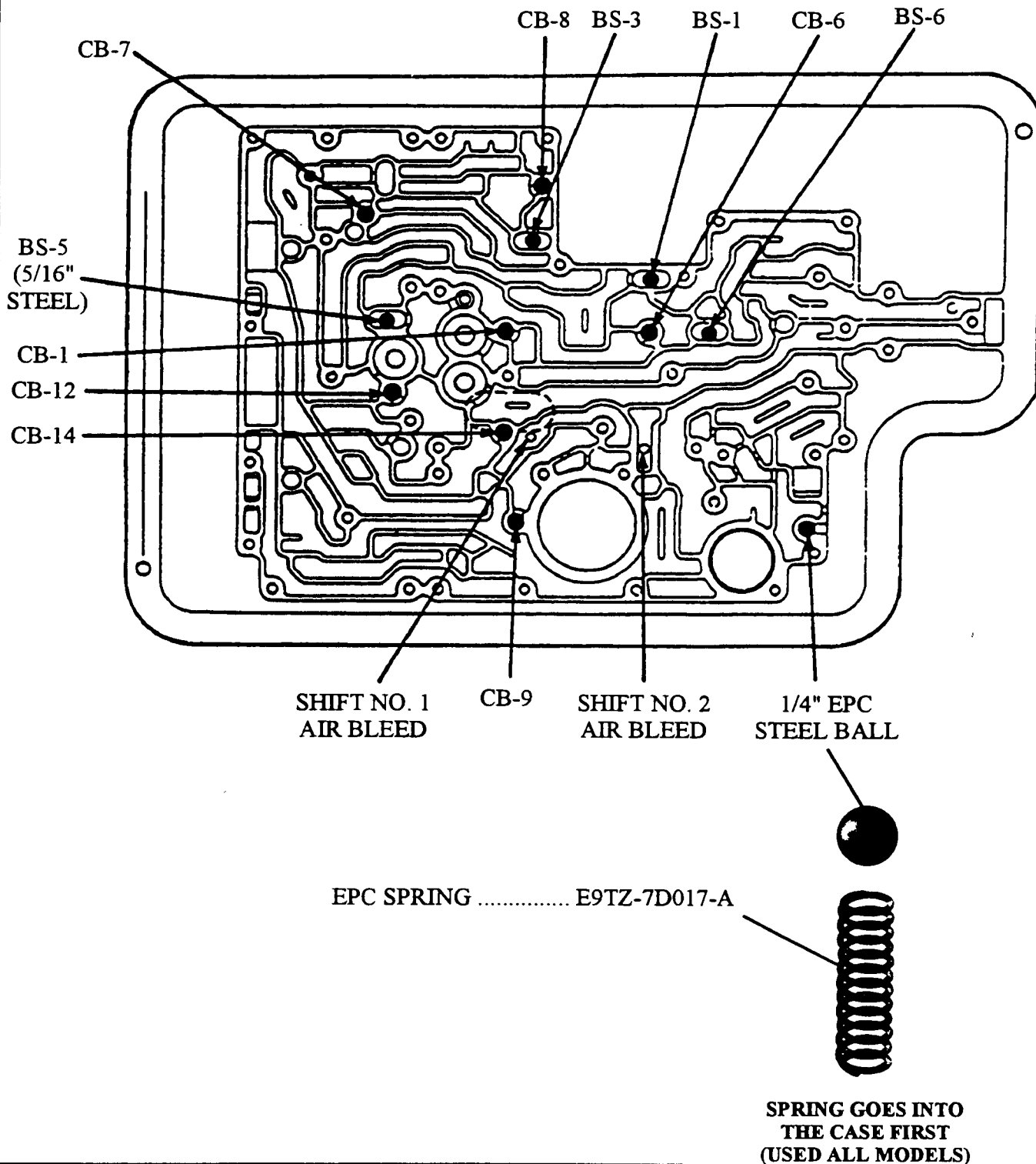


Figure 57

**1990 - 1995 CASE CHECKBALL LOCATIONS
REQUIRES NINE (5/16") RUBBER BALLS**

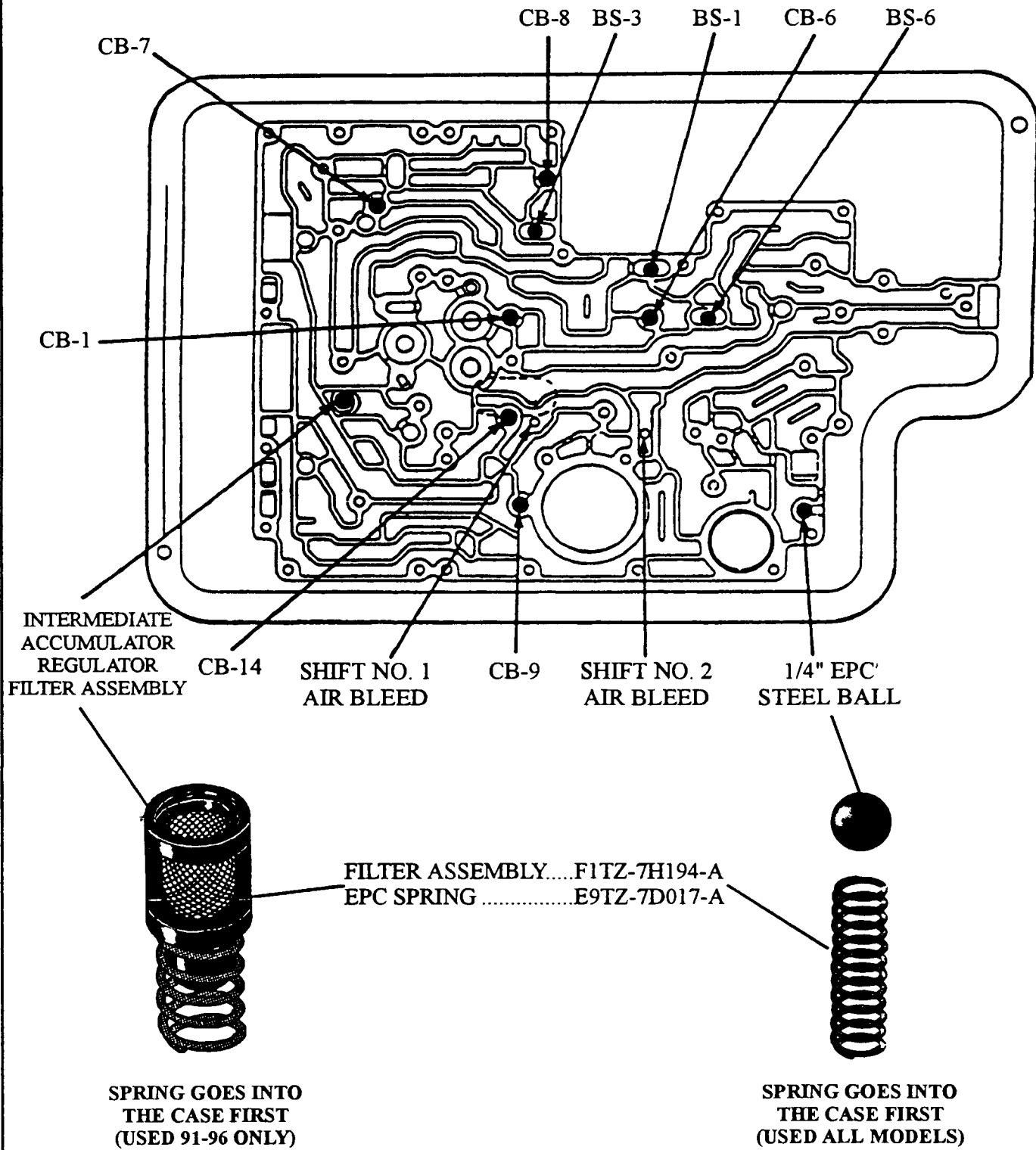


Figure 58

FORD E4OD

1996-1998 CASE CHECKBALL LOCATIONS

REQUIRES EIGHT (5/16") RUBBER BALLS

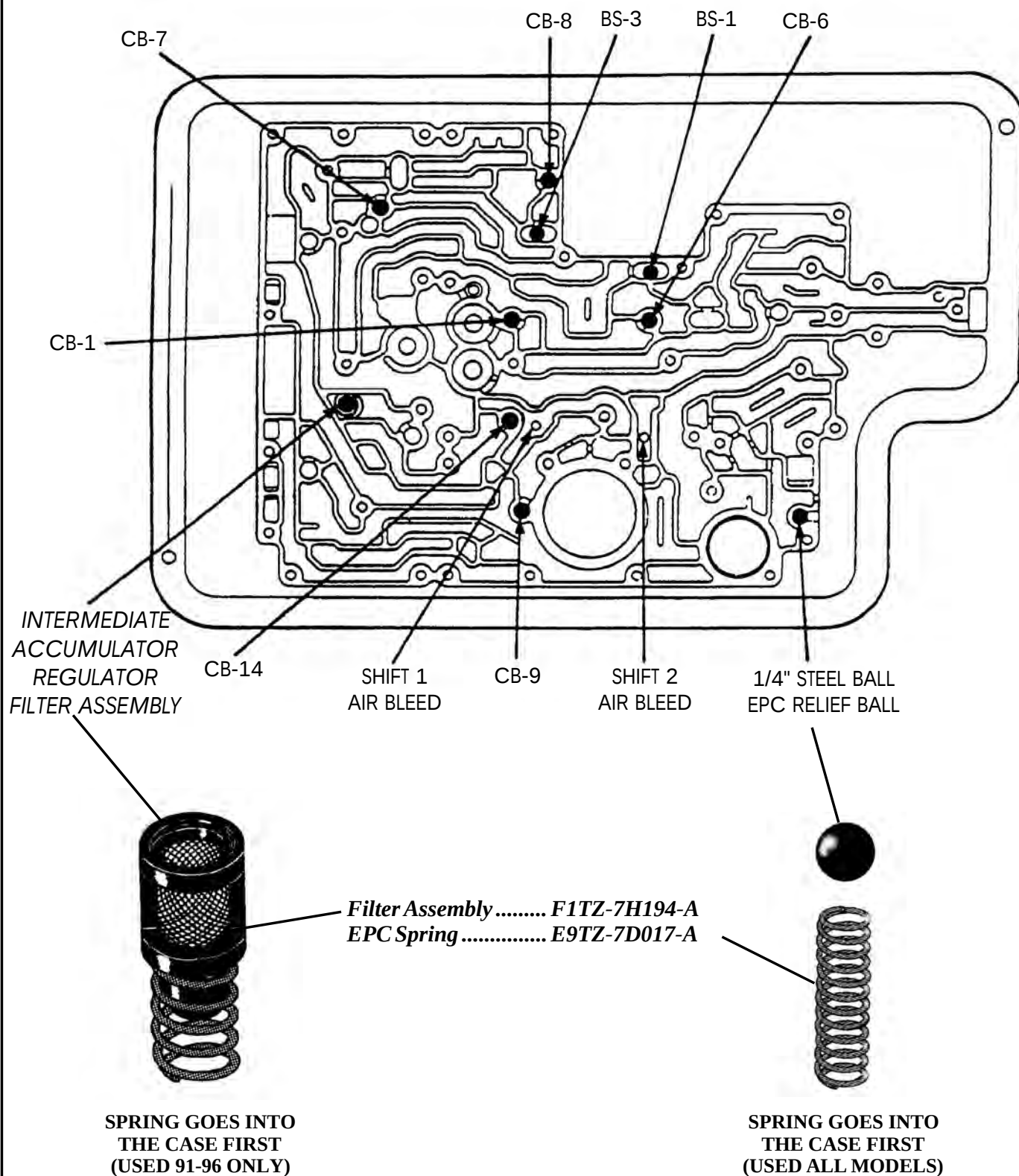


Figure 59

FORD 4R100

1998-2003 CASE CHECKBALL LOCATIONS

REQUIRES EIGHT (5/16") RUBBER BALLS

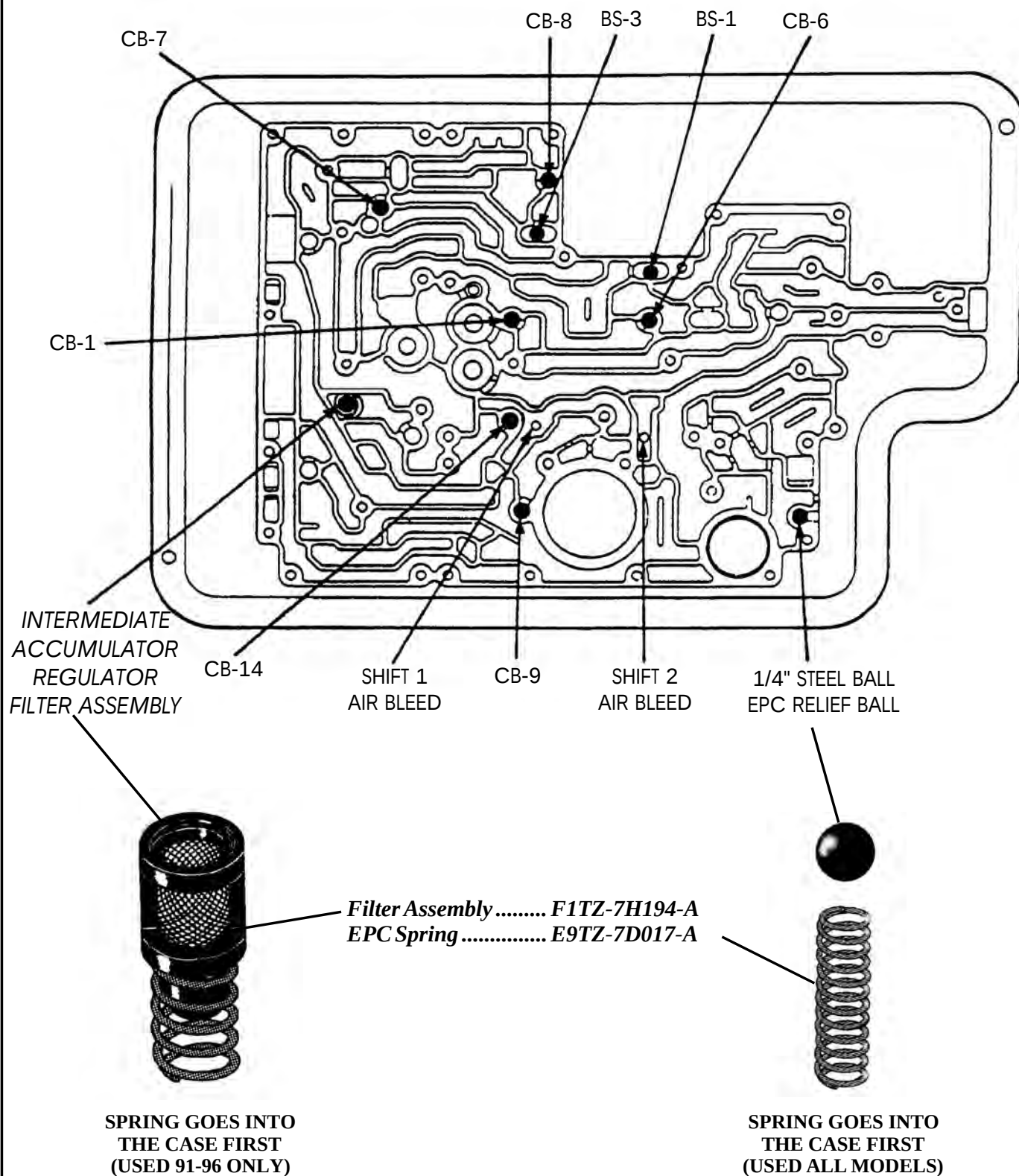


Figure 60

FORD ATX

VALVE BODY CHECKBALL LOCATIONS
1981 - 1986 ONLY

(USES THE GEAR TYPE CONVERTER)
REQUIRES 5 CHECKBALLS

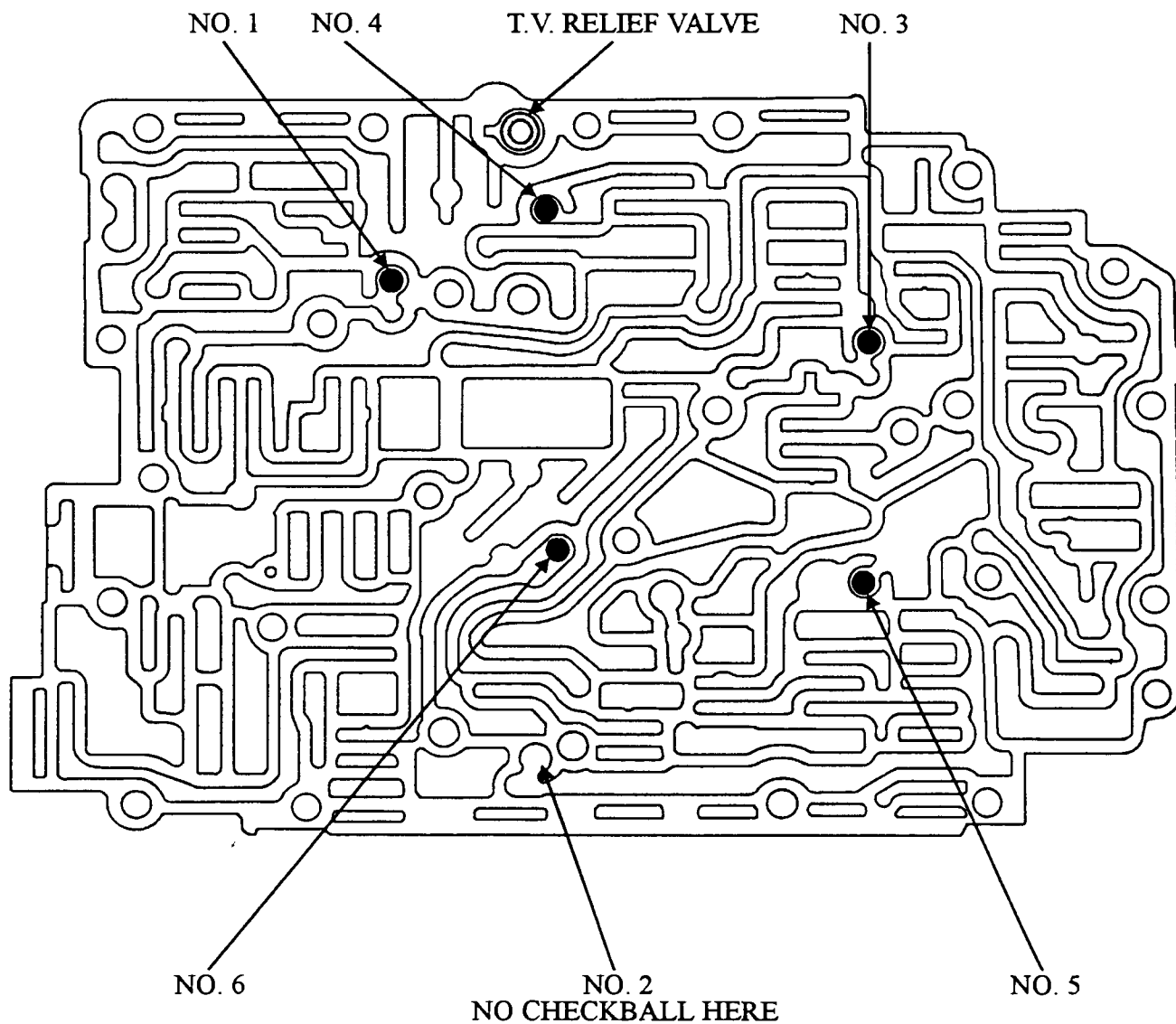


Figure 61

FORD ATX

VALVE BODY CHECKBALL LOCATIONS TAURUS/SABLE 2.5L ENGINE

*(USES THE CLC TYPE CONVERTER)
REQUIRES 6 CHECKBALLS*

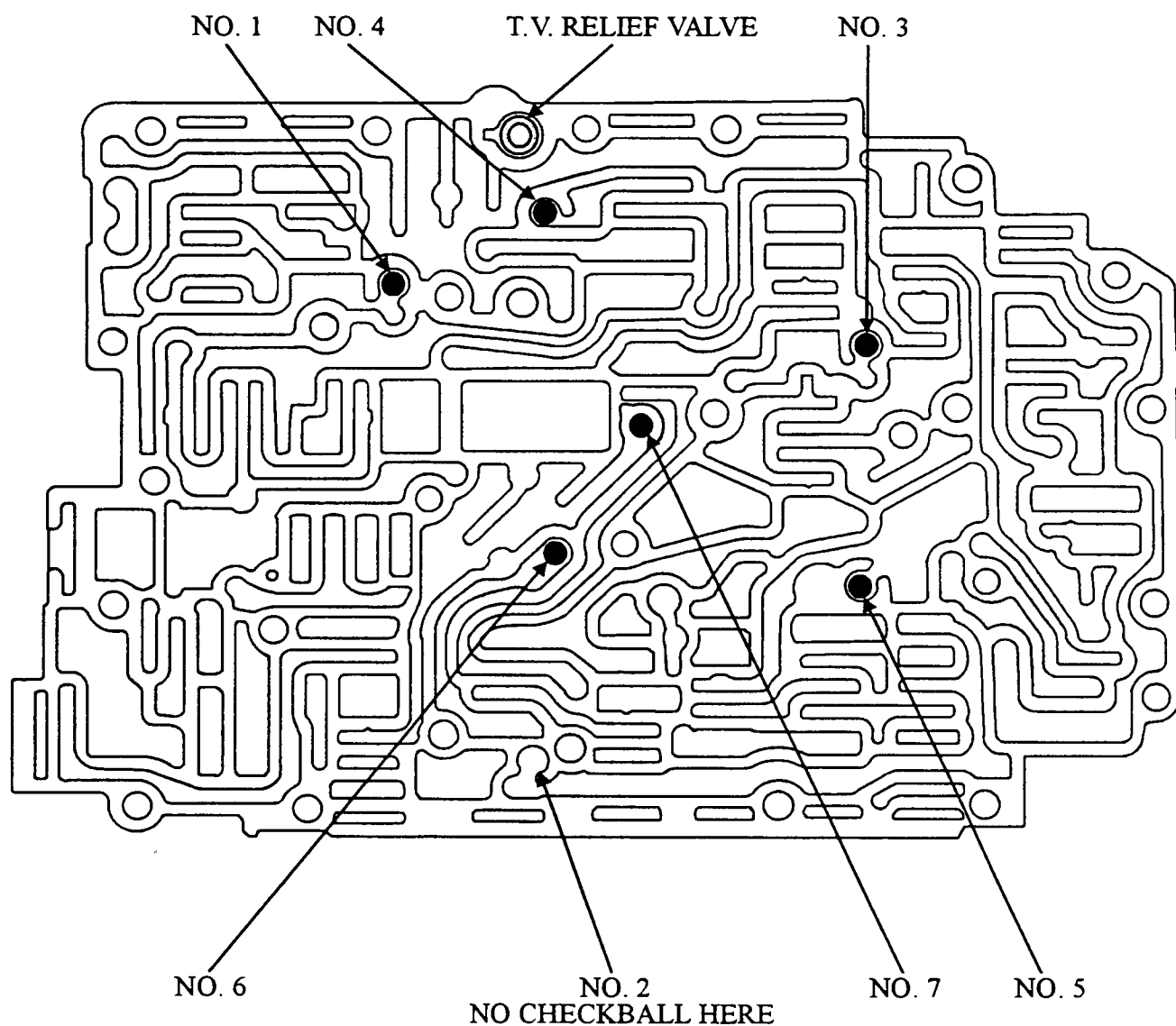


Figure 62

FORD ATX

VALVE BODY CHECKBALL LOCATIONS 1987-UP TEMPO/TOPAZ

*(USES THE FLC TYPE CONVERTER)
REQUIRES 7 CHECKBALLS*

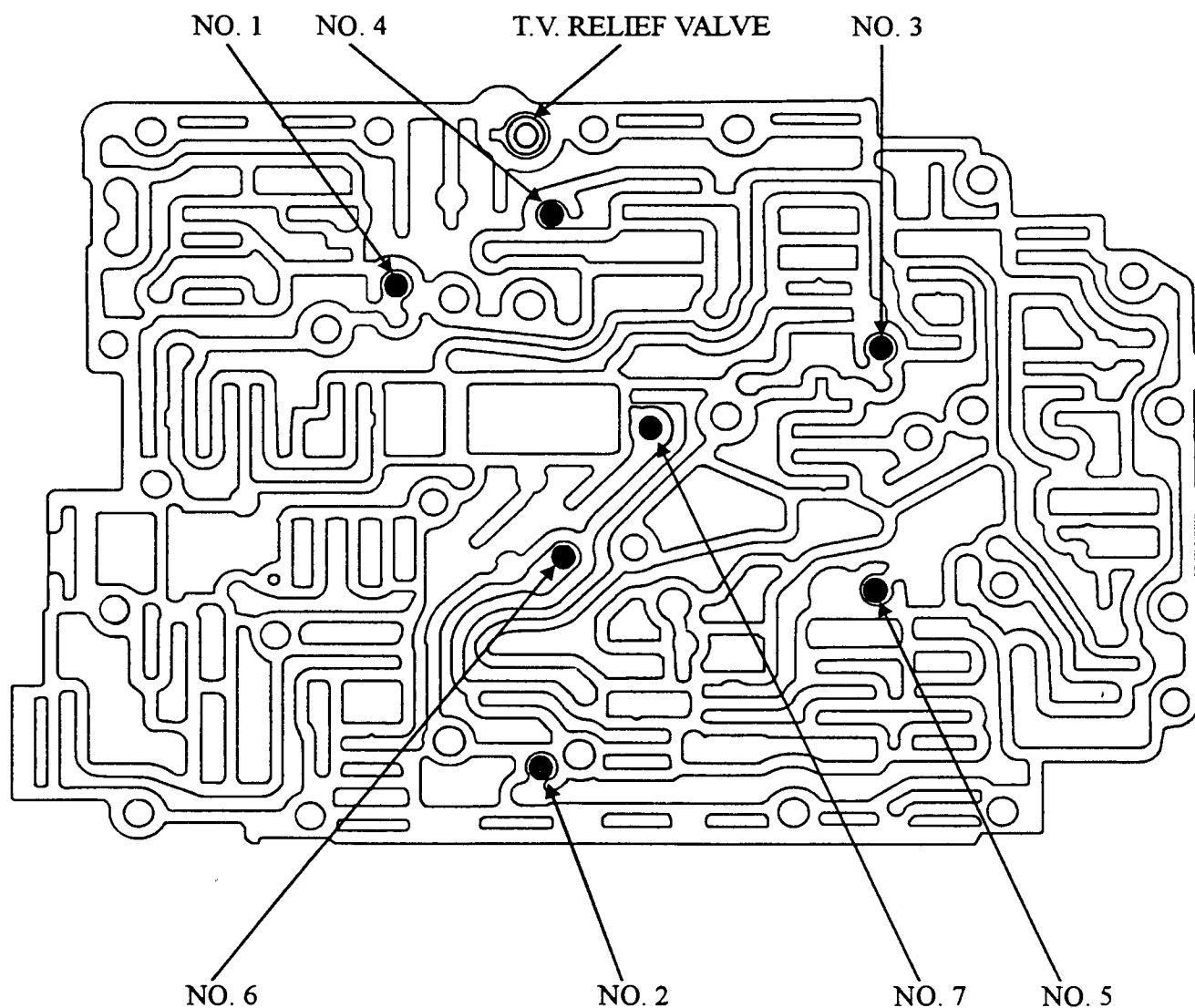


Figure 63

FORD ATX TRANSMISSION
CHECK BALL FUNCTION

- NO. 1 - Reverse clutch orifice control ball - controls the apply of the reverse clutch.
- NO. 2 - Direct clutch orifice control ball - controls the apply of the third clutch through the "B" orifice in the spacer plate.
- NO. 3 - D, 1, 2 orifice control ball for servo apply - forces servo apply oil through a "C" orifice in the spacer plate via the 2-3 backout valve.
- NO. 4 - Reverse orifice control ball through 2-3 shift valve for servo release - the direct clutch is applied by a modulated line pressure through the # 4 check ball, the 2-3 shift valve, the manual downshift modulator valve and orifice B. When the selector lever is moved out of reverse, it forces this pressure to be exhausted through the "D" orifice in the spacer plate.
- NO. 5 - Reverse/3rd servo release exhaust ball - forces servo release oil to be exhausted through the 3-2 kickdown valve, 3-2 torque demand timing valve, 2-3 shift valve, through orifice "D" in the spacer plate and out to an exhaust at the manual valve.
- NO. 6 - R, 1, 2/Kick down shuttle ball - allows Reverse, manual low and manual 2 oil to be directed to the 2-3 shift T.V. modulator valve to prevent the valve from going into regulation causing the circuit to be filled with line pressure. This action keeps the 2-3 shift valve in a closed position. In the drive position, this ball allows kick down pressure to enter the spring chamber of the 2-3 shift T.V. modulator valve kickdown valve. This action prevents the valve from modulating allowing full T.V. pressure to work on closing the 2-3 shift valve for a 3-2 kickdown.
- NO. 7 - This ball orifices intermediate clutch exhaust on a 3-1 or 2-1 downshift for a controlled release.

Figure 64

FORD AXOD TRANSMISSION
VALVE BODY CHECKBALL LOCATIONS

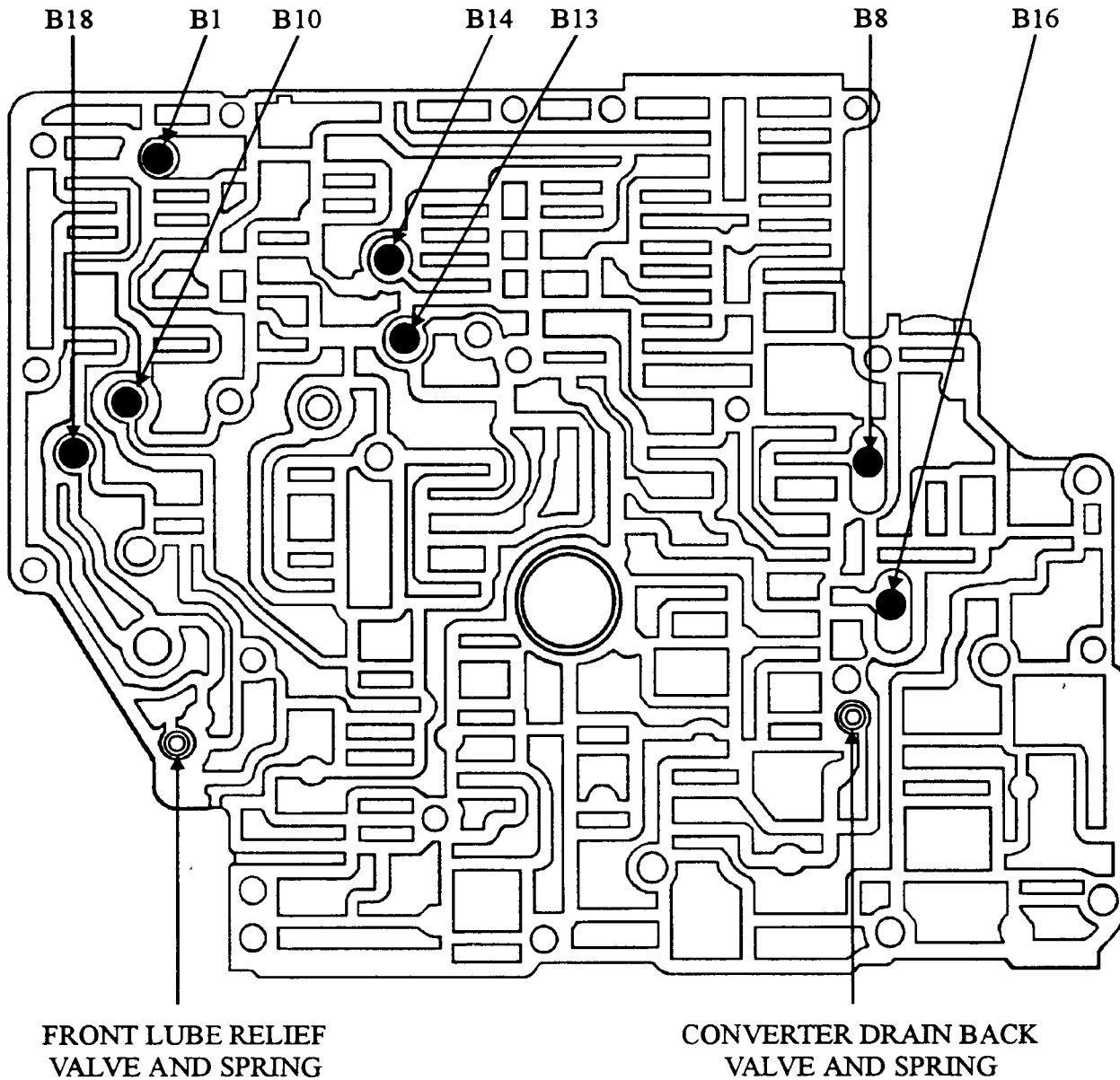


Figure 65

FORD AXOD TRANSMISSION

PUMP BODY CHECKBALL LOCATIONS

(9 CHECK BALL PUMP ONLY)

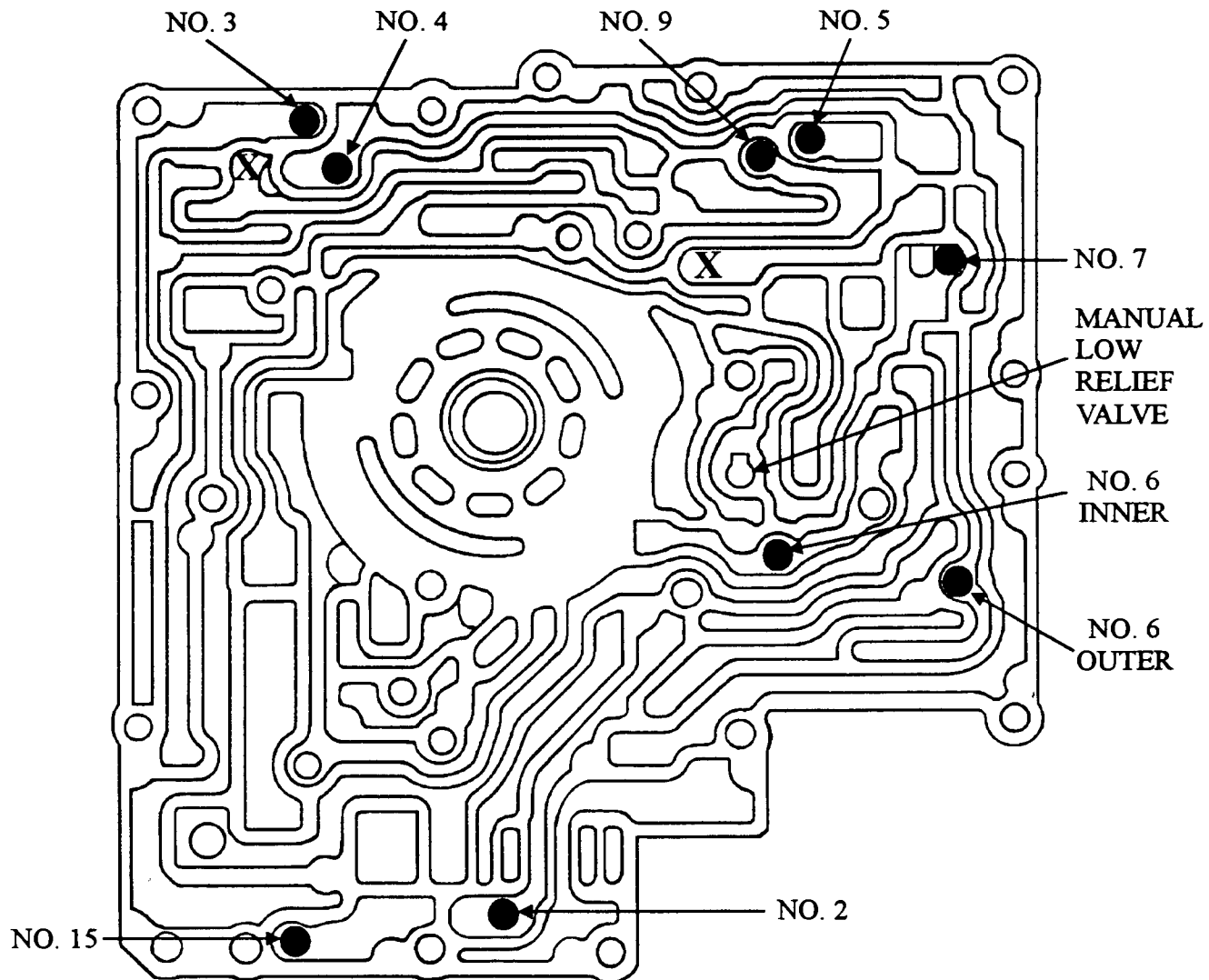


Figure 66

FORD AXOD TRANSMISSION
PUMP BODY CHECKBALL LOCATIONS
(10 CHECK BALL PUMP ONLY)

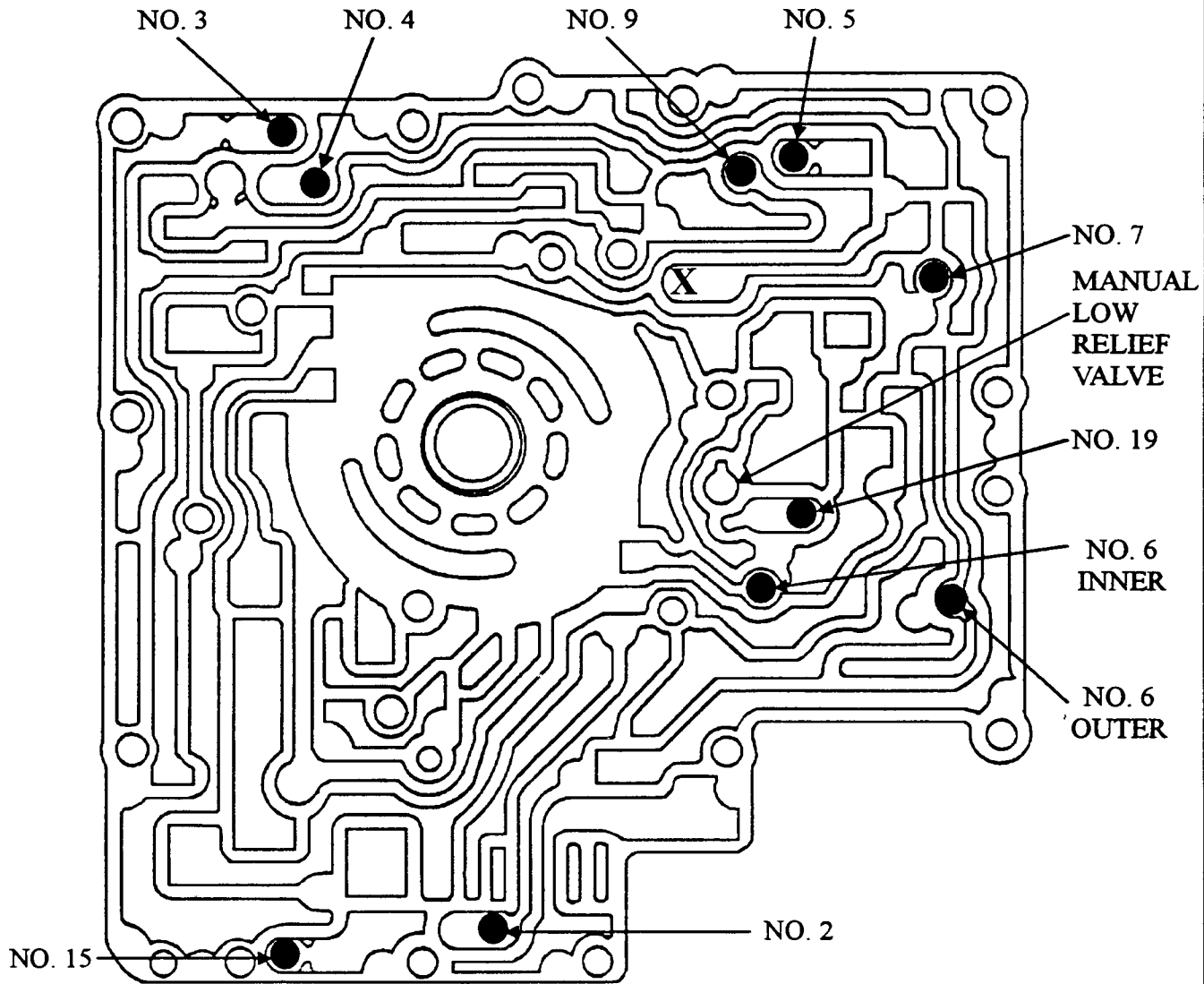


Figure 67

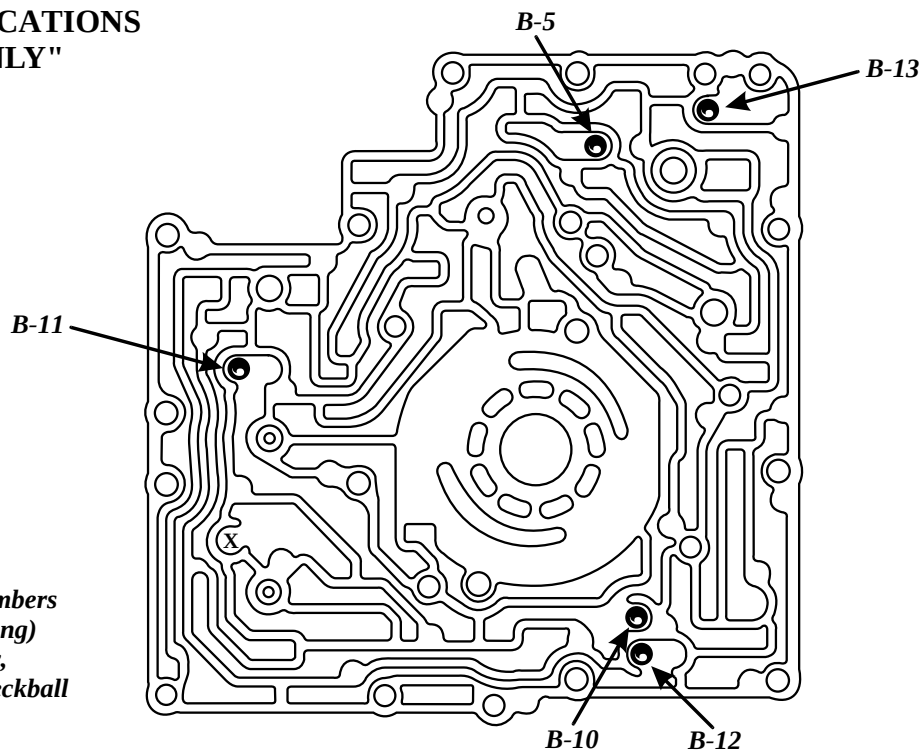
FORD AXOD TRANSMISSION
CHECK BALL FUNCTION

- B1: Forces reverse clutch feed oil through the A orifice and thermal element while allowing the clutch to exhaust without restriction.
- B2: Separates reverse clutch and forward clutch circuits feeding the forward clutch.
- B3: Separates manual low relief and TVLM passages to the main regulator boost valve.
- B4: Separates manual low relief and direct clutch circuits to the direct clutch.
- B5: Connects low/intermediate servo release and direct clutch passages during pressurization of these circuits while forcing low/intermediate servo release to be exhausted through the L orifice and the 3-2 control valve.
- B6: (2 required) Forces forward clutch feed oil through the K orifice for the 4-3 downshift while bypassing the orifice for a drive engagement.
- B7: Allows forward clutch to exhaust freely on the 3-4 upshift but forces forward clutch apply through the K orifice for the 4-3 downshift.
- B8: Separates low and kickdown circuits to the 2-3 shift valve.
- B9: Forces the direct clutch to exhaust through the M orifice on a 3-2 downshift while bypassing the orifice for the 3-1 downshift.
- B10: Exhausts low/intermediate servo apply directly through the manual valve on a drive-neutral or a drive-reverse engagement bypassing the B orifice.
- B11: Not used.
- B12: Not used.
- B13: Forces direct clutch feed through the E and F orifice bypassing the M orifice.
- B14: Forces overdrive servo apply feed through the H and G orifices while bypassing the orifices for exhaust.
- B15: Applies forward clutch through the PP orifice as well as the K orifice for a manual 3 pull in.
- B16: Separates the low and backout circuits to the backout valve.
- B17: Not used.
- B18: Feeds the N-D accumulator through the RR and SS orifices in parallel and exhausts N-D accumulator through the RR and SS orifices in series.

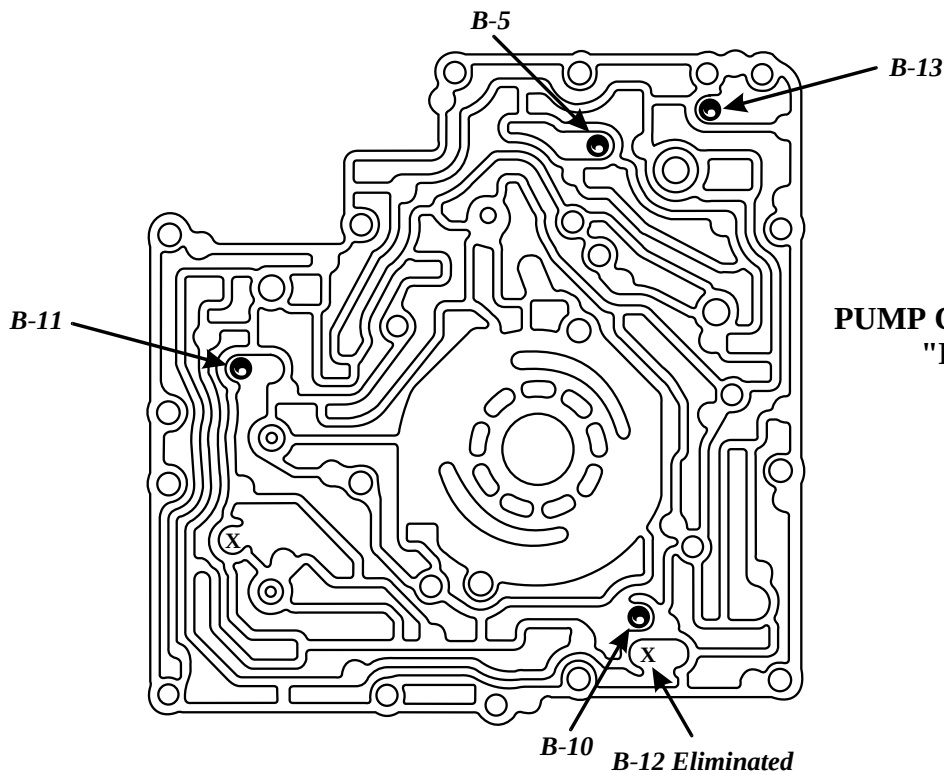
Figure 68

PUMP CHECKBALL LOCATIONS "EARLY" 1991 "ONLY"

Transaxle Serial Numbers
(Up To And Including)
See Chart Below,
Get A Number 12 Checkball



Vehicle Line	Up To And Including Serial Number	Model Code
1991 Taurus/Sable 3.8L	54553	PNA-EA
1991 Taurus/Sable 3.0L	195343	PNA-EC
1991 Continental 3.8L	39653	PNA-EB
1991 All Police 3.8L	10936	PNA-EE

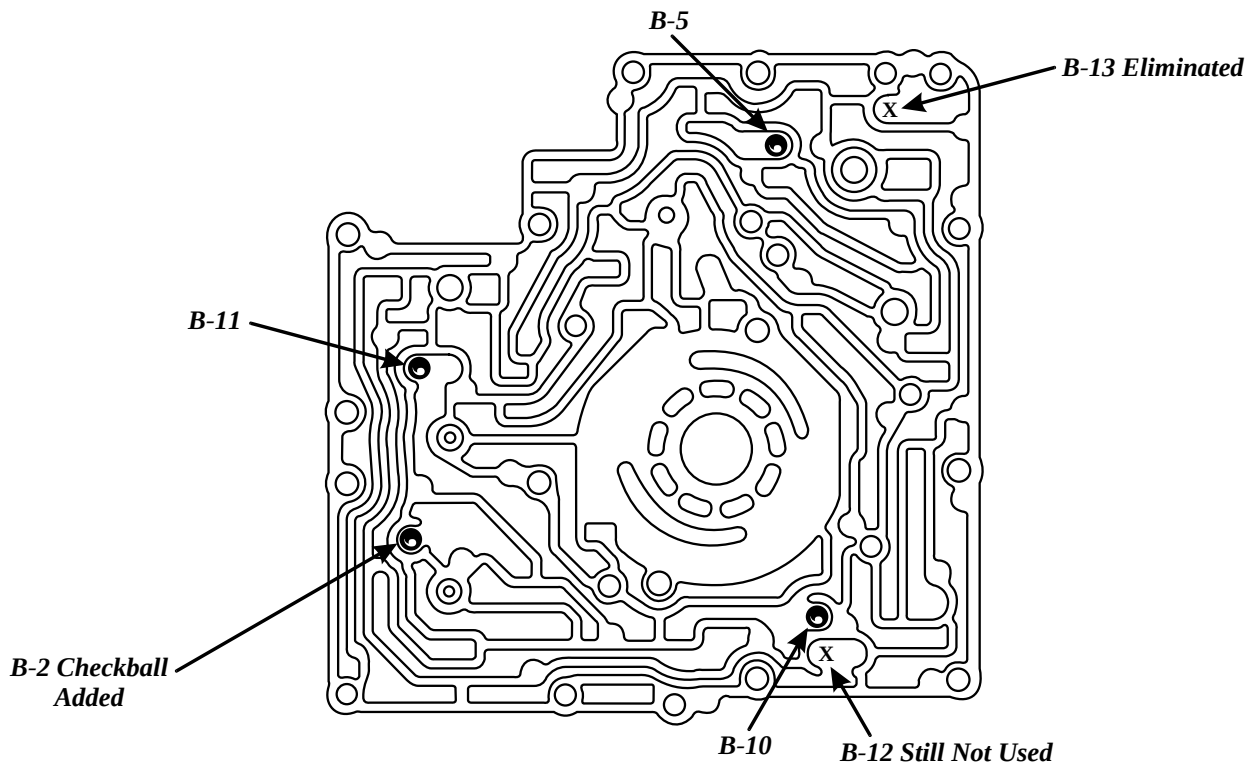


PUMP CHECKBALL LOCATIONS "LATE" 1991 "ONLY"

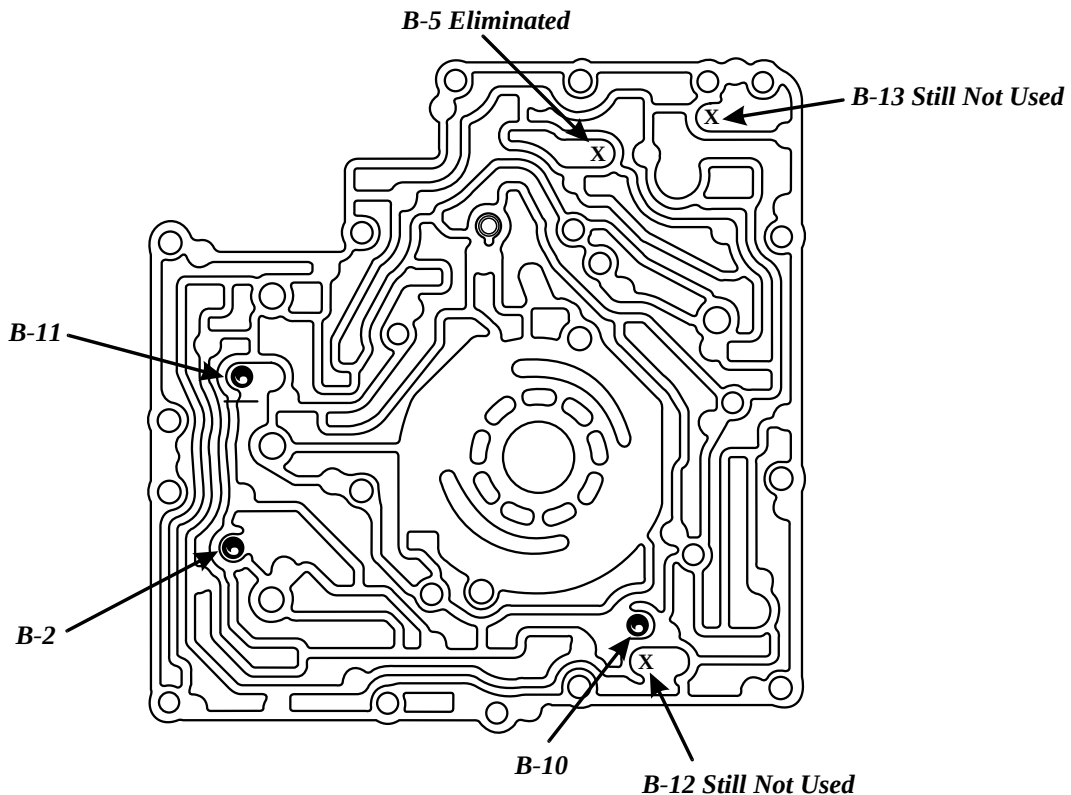
Copyright © 2002 ATSG

Figure 69

PUMP CHECKBALL LOCATIONS 92-98 MODELS "ONLY"



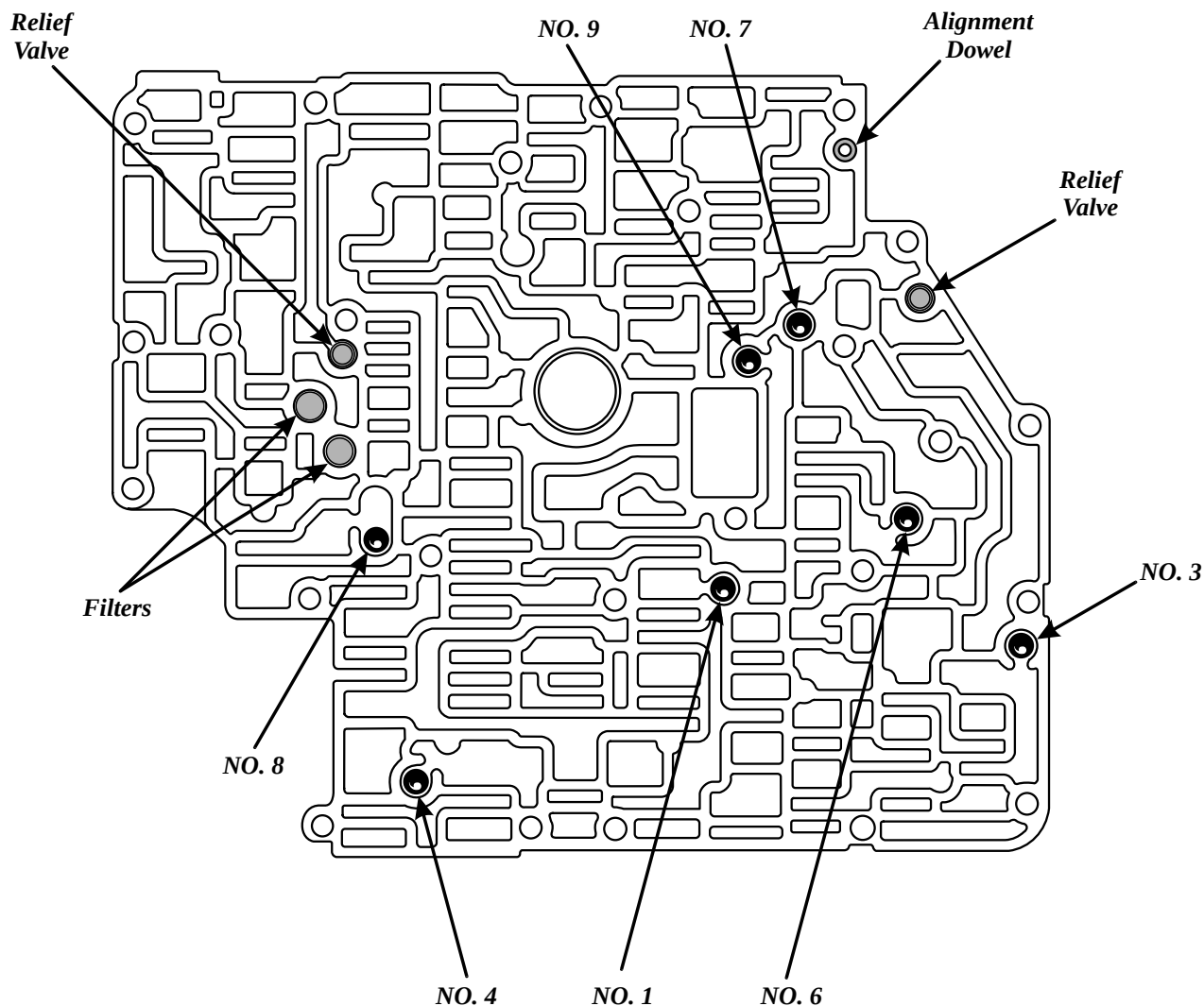
PUMP CHECKBALL LOCATIONS 1999 AND LATER "ONLY"



Copyright © 2002 ATSG

Figure 70

AXODE (AX4S) 1991-1992 ONLY CHECKBALL AND RELIEF VALVE LOCATIONS



B1: Forces reverse clutch feed oil through the A orifice while allowing the clutch to exhaust without restriction.

B2: Forces forward clutch feed oil through the K orifice for a controlled engagement. Added in 1992.

B3: Forces Low/Inter. Servo apply pressure to be routed through the 2-3 servo regulator valve and engagement valve.

B4: Forces Overdrive Servo apply oil through the H orifice for a controlled apply.

B5: Separates Reverse apply oil from the Low/Intermediate band apply circuit. Eliminated in 1999.

B6: Directs Low/Inter. Band release oil to be exhausted at the 1-2 shift valve, on 4-2 or 3-2 downshift.

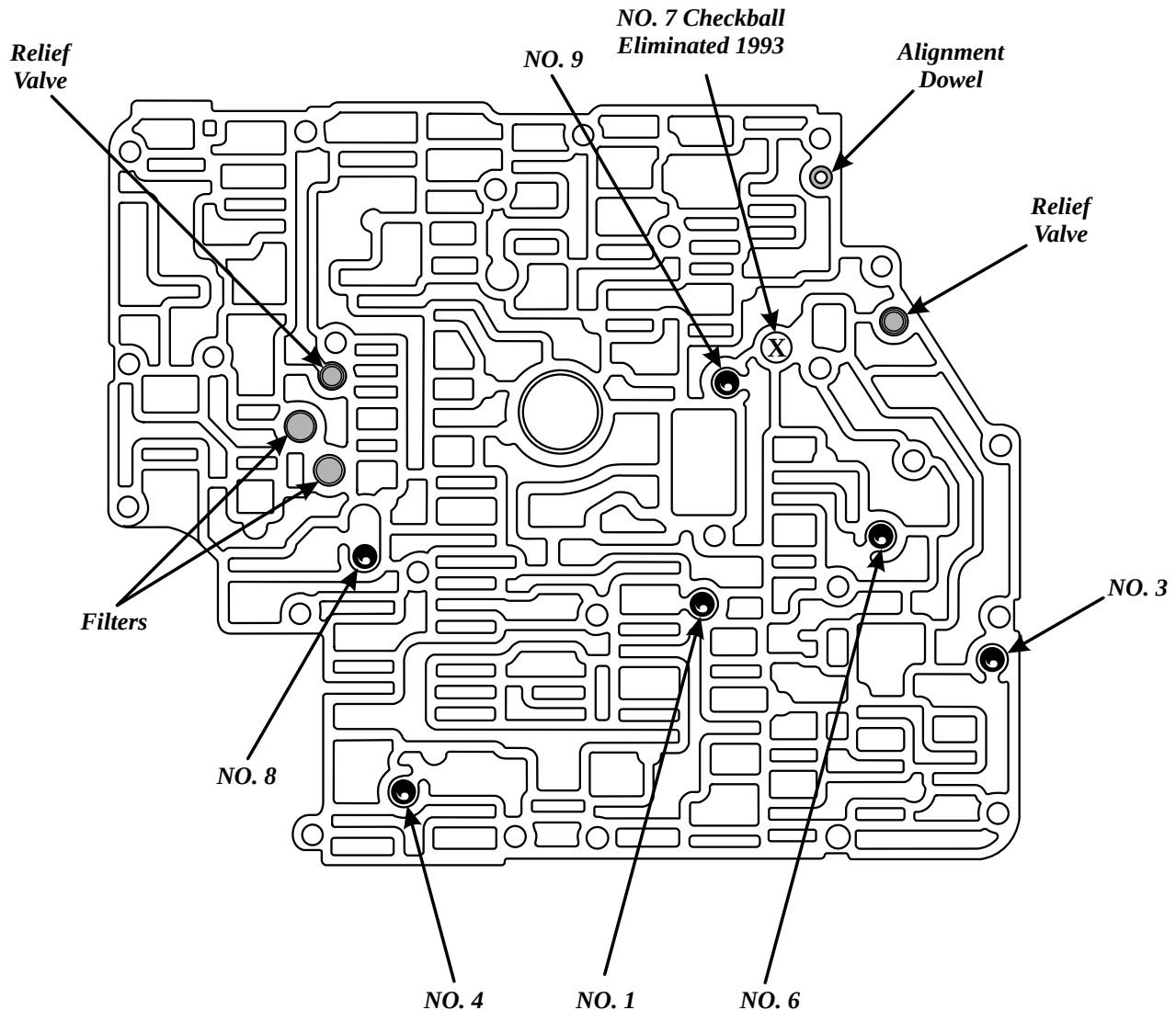
B7: Forces Direct Clutch and Low/Intermediate Band release oil to be exhausted at the 1-2 shift valve, on a 4-2 or 3-2 downshift, and was eliminated in 1993.

B8: Separates Direct Clutch apply circuit, from Manual 1st direct clutch apply circuit.

Copyright © 2002 ATSG

Figure 71

AXODE (AX4S) 1993-1998 CHECKBALL AND RELIEF VALVE LOCATIONS



B9: Forces Direct Clutch apply oil and Low/Intermediate release oil to pass through the F orifice.

B10: Blocks Intermediate Clutch apply oil from entering the Low/Intermediate Band release circuit.

B11: This is Direct Clutch "Shuttle" ball. On the 2-3 shift, the direct clutch and band release is fed from the 2-3 shift valve via the 1-2 shift valve. When the 3-4 shift valve strokes, the 3-4 shift valve becomes the source of direct clutch and band release feed.

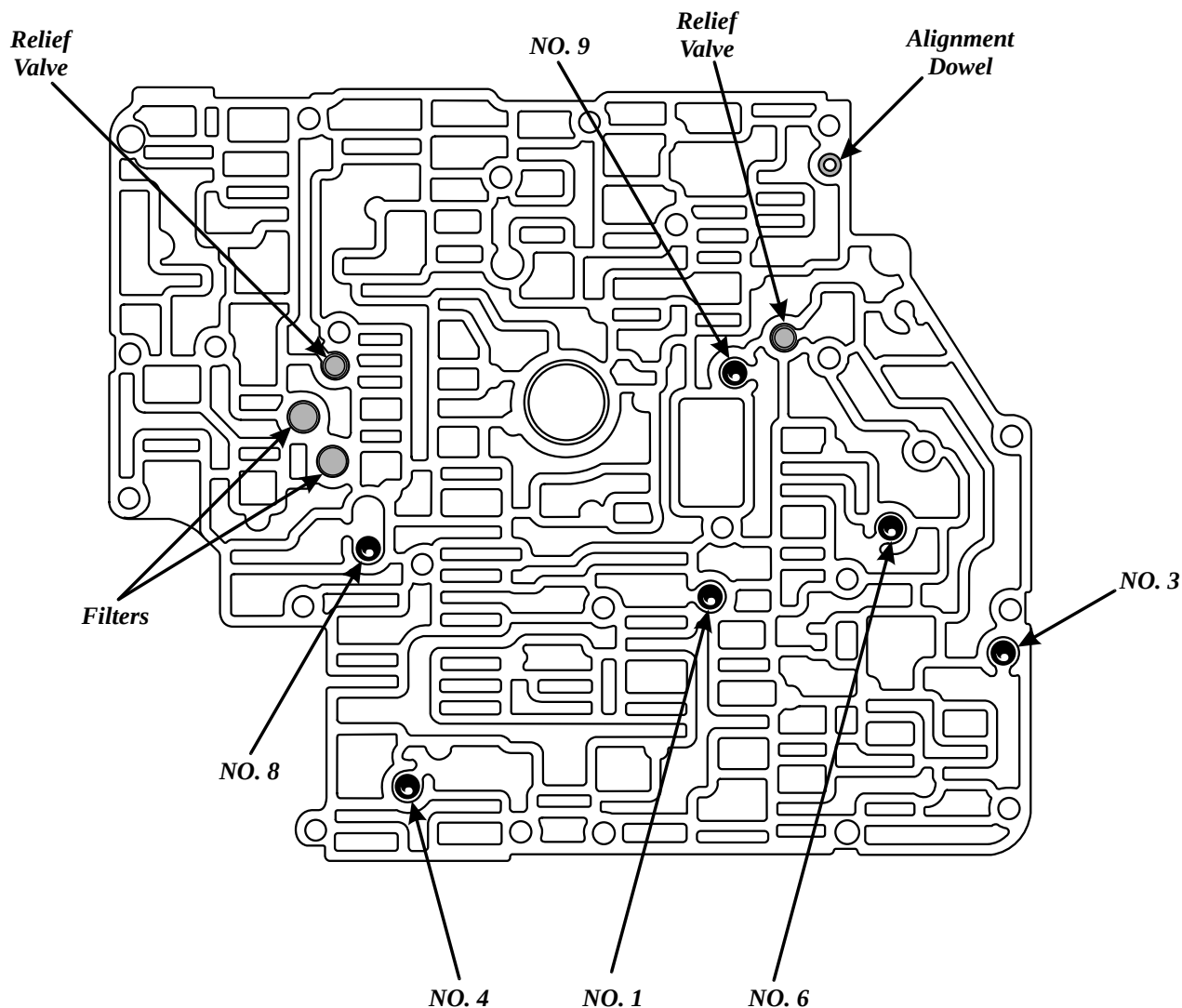
B12: Separates EPC pressure from the L234 pressure passages, and eliminated in late 1991.

B13: Forces Forward Clutch oil to be exhausted through the B orifice during a 3-4 upshift, and eliminated in 1992.

Copyright © 2002 ATSG

Figure 72

AXODE (AX4S) 1999-2002 CHECKBALL AND RELIEF VALVE LOCATIONS

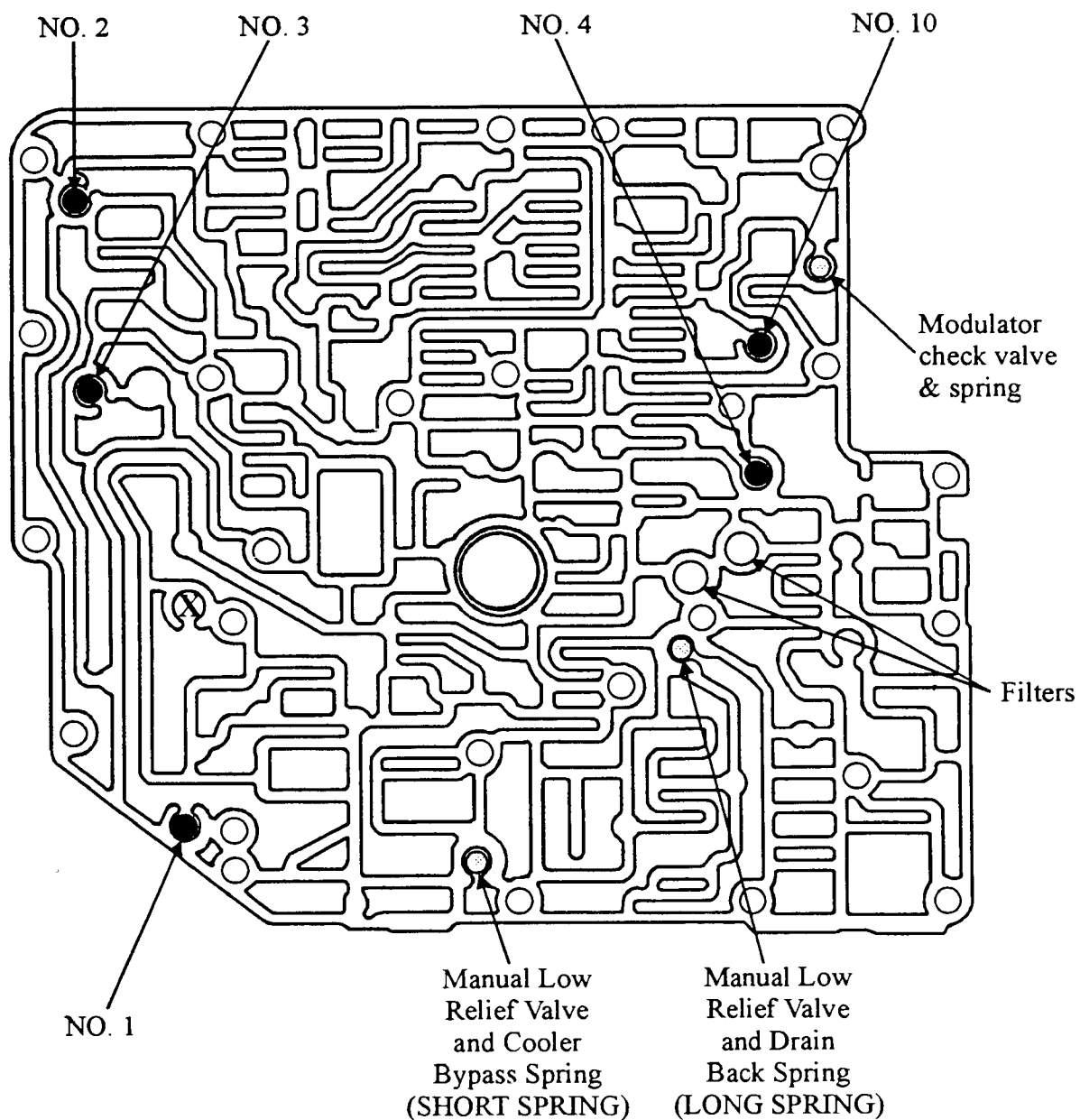


Copyright © 2002 ATSG

Figure 73

FORD AX4N TRANSMISSION

VALVE BODY CHECKBALL LOCATIONS

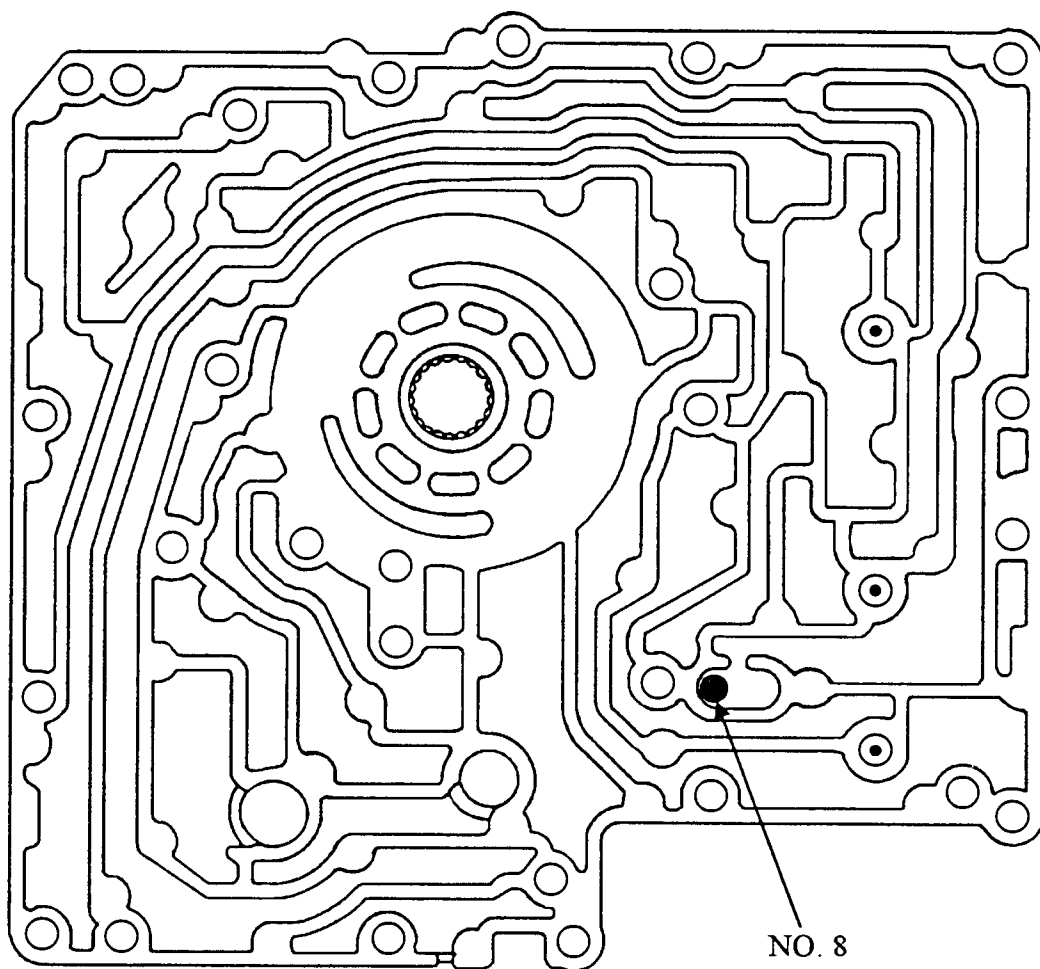


CAUTION: Springs are not interchangeable

Figure 74

FORD AX4N TRANSMISSION

PUMP CHECKBALL LOCATIONS



NOTE: If the number 8 ball is missing direct clutch oil will exhaust through the 1-2 shift valve. A no 2-3 upshift will occur as well as no engine breaking in manual low.

Figure 75

FORD AX4N TRANSMISSION***CHECK BALL FUNCTION***

- B1: Forces reverse clutch feed oil through the A orifice while allowing the clutch to exhaust without restriction.
- B2: Forces the Coast Band apply oil through the N orifice for a controlled apply.
- B3: Forces Low/Intermediate Clutch apply pressure through the E orifice for a controlled apply.
- B4: Forces Forward Clutch apply pressure through the X orifice for a controlled apply.
- B8: Separates Direct Clutch apply pressure in the drive range from Direct Clutch apply pressure in the manual low range.
- B10: Forces Intermediate Clutch apply through the GG orifice for a controlled apply.

Figure 76

F3A
MAIN VALVE BODY & CASE CHECK BALL
& ORIFICE LOCATION

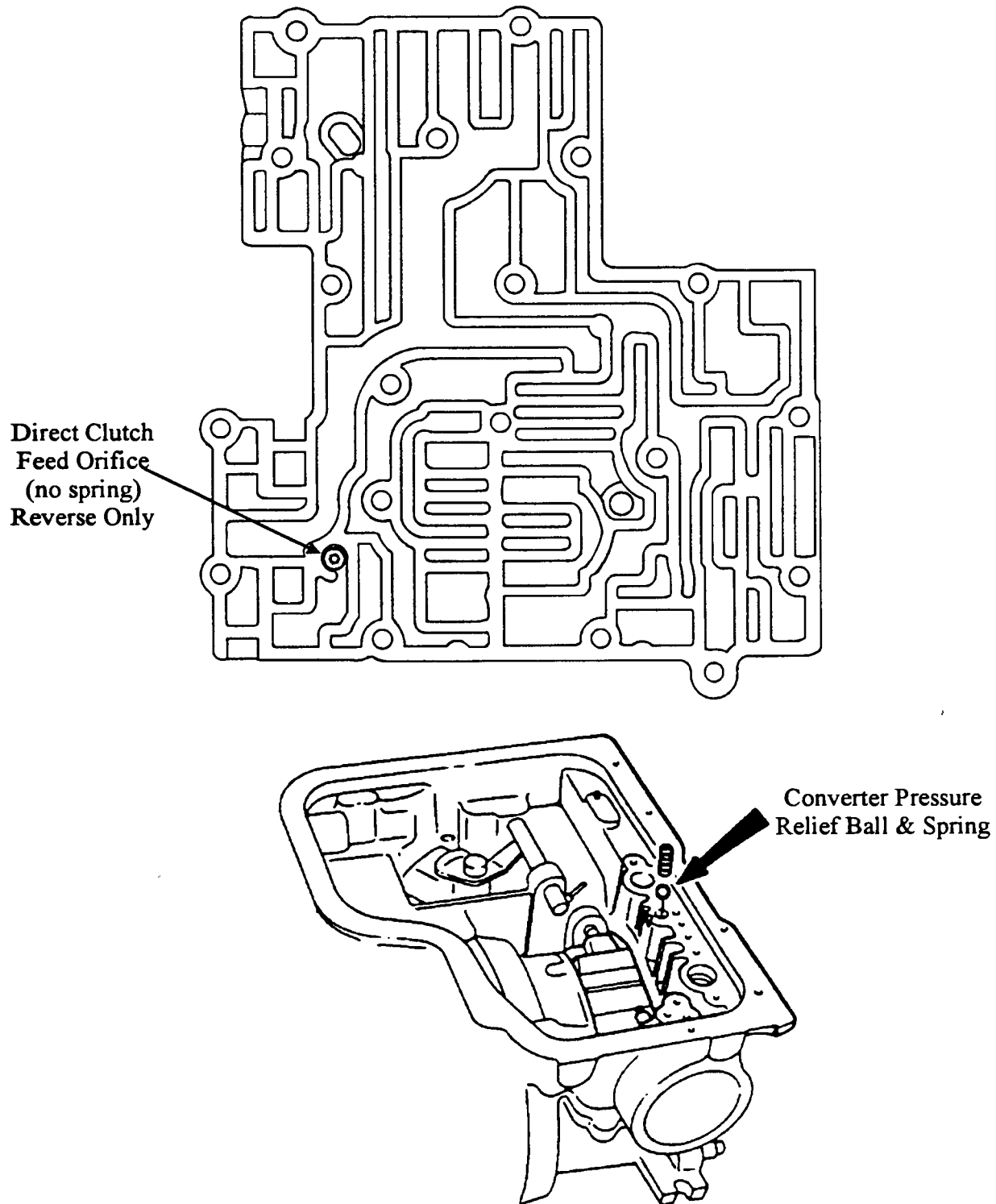


Figure 77

F3A
MAIN VALVE BODY & CASE CHECK BALL
& ORIFICE LOCATION

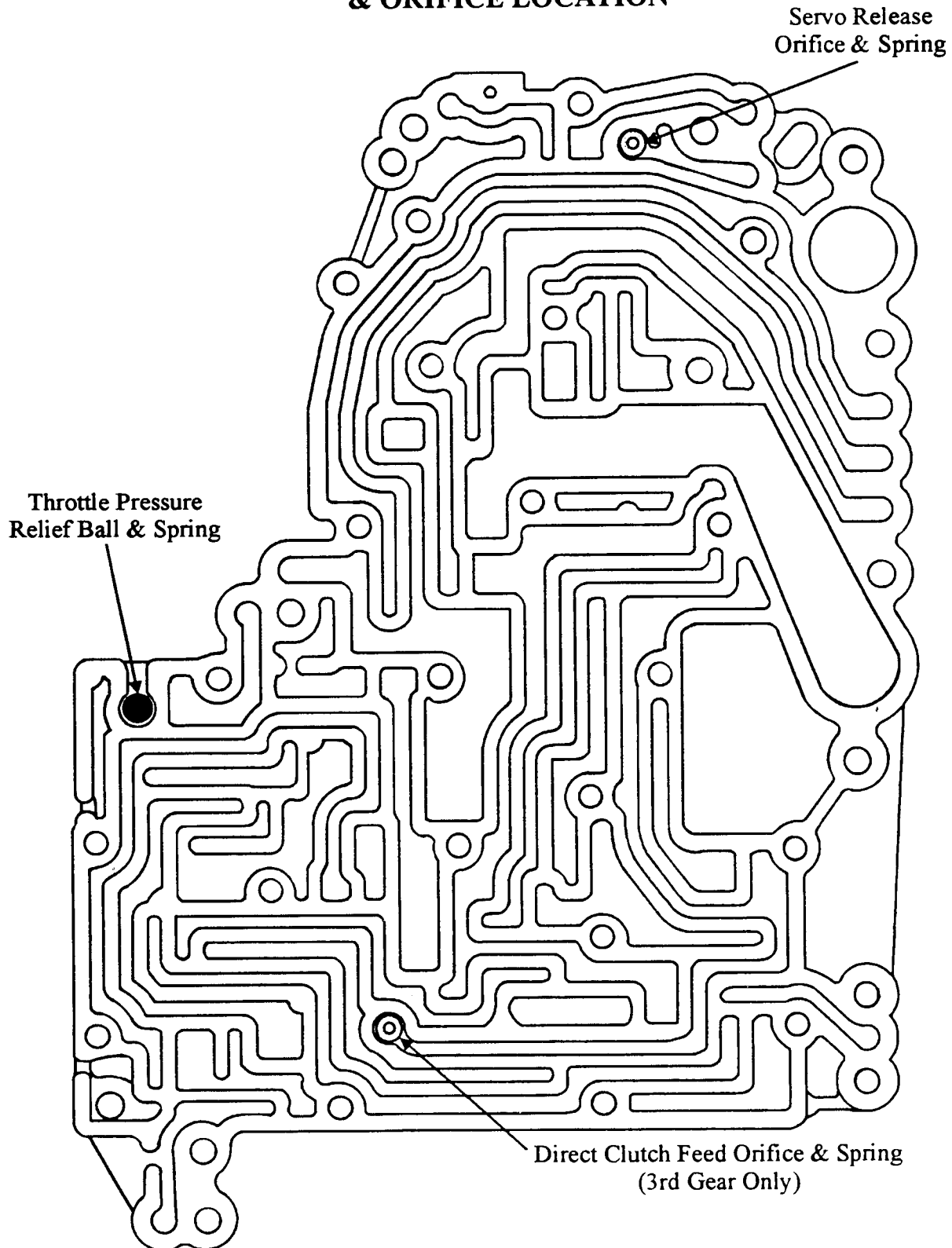
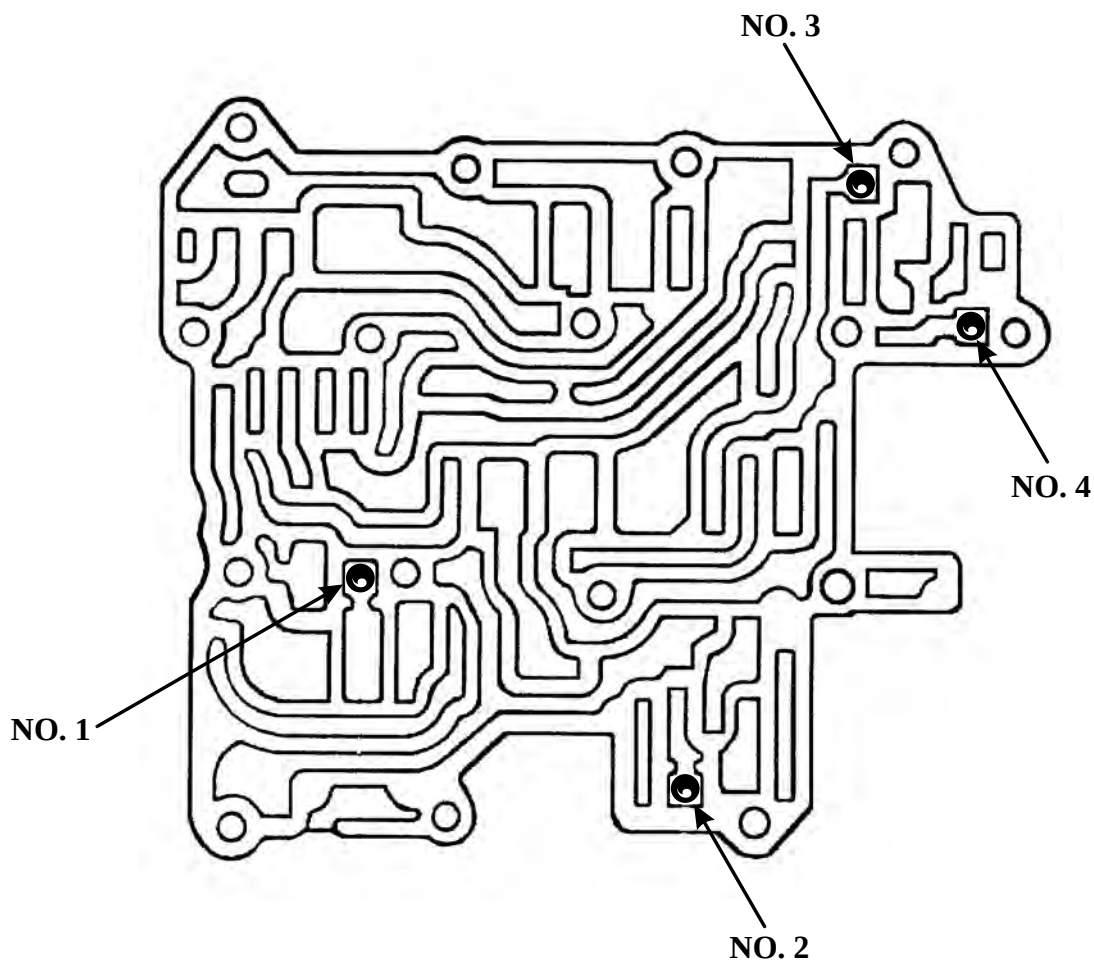


Figure 78

SPRINT MX-17 UPPER VALVE BODY CHECKBALL LOCATIONS



Copyright © 2002 ATSG

Figure 79

MX17
LOWER VALVE BODY BY-PASS
VALVE LOCATION

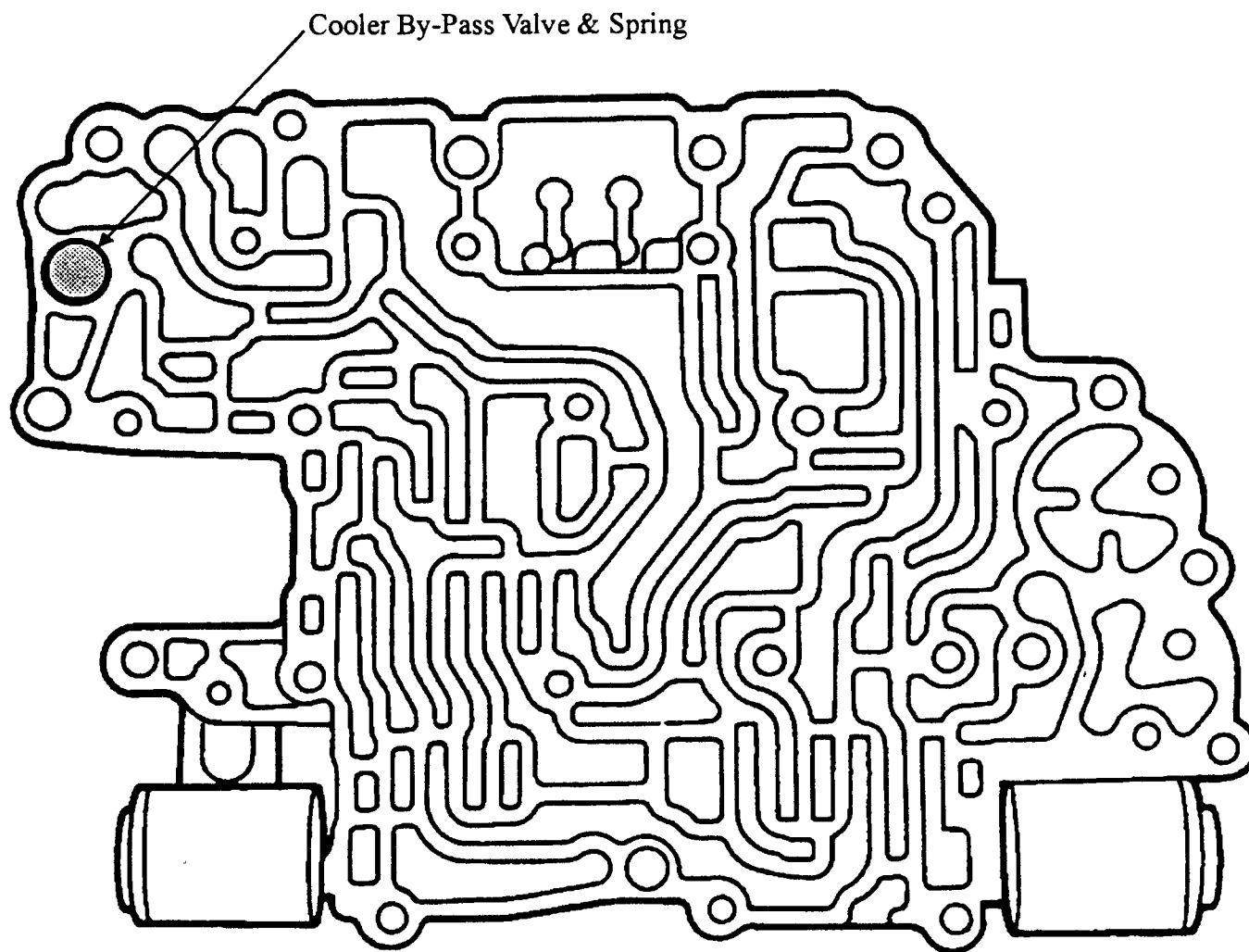


Figure 80

A130
LOWER VALVE BODY
CHECK BALL LOCATION

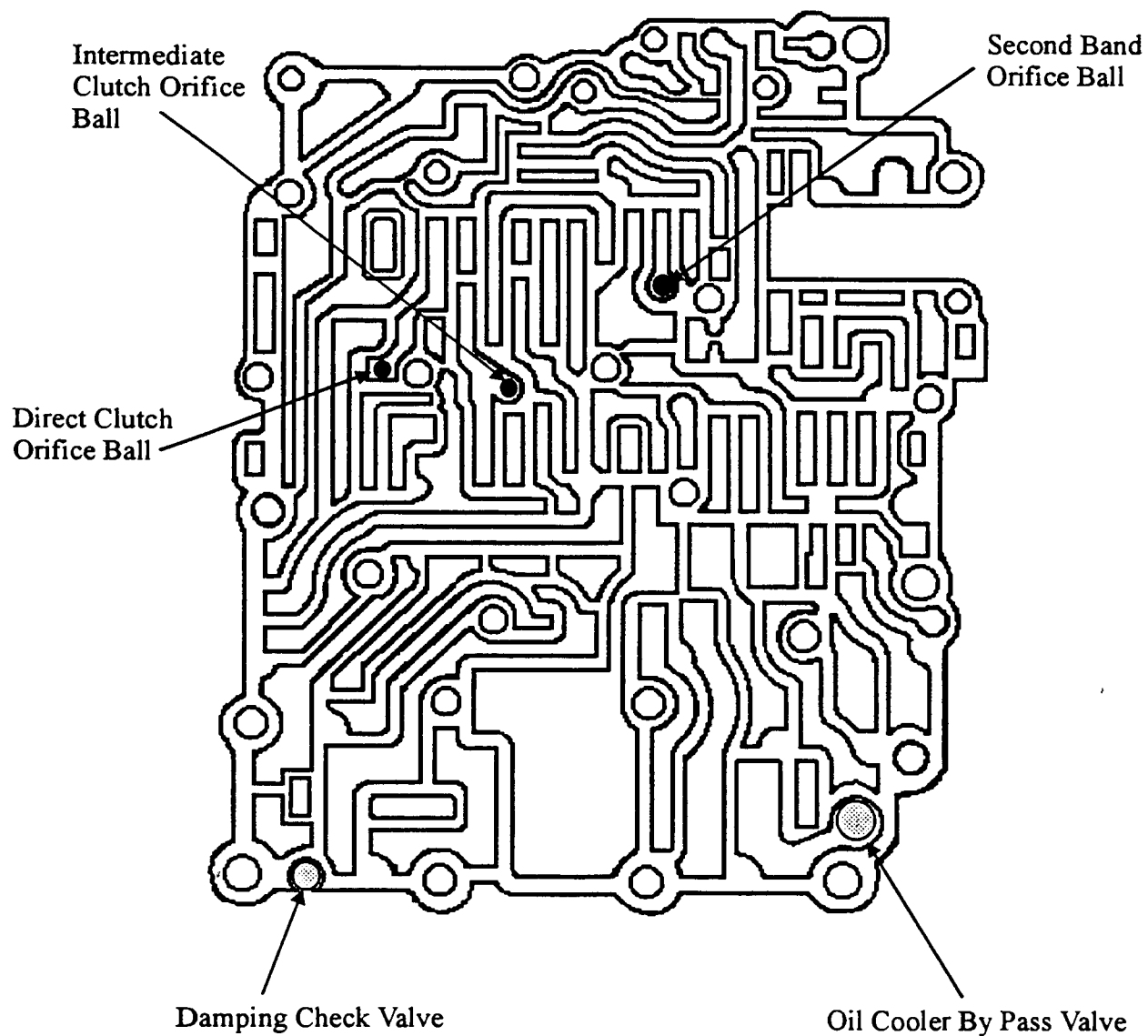


Figure 81

A130
UPPER VALVE BODY
CHECK BALL LOCATION

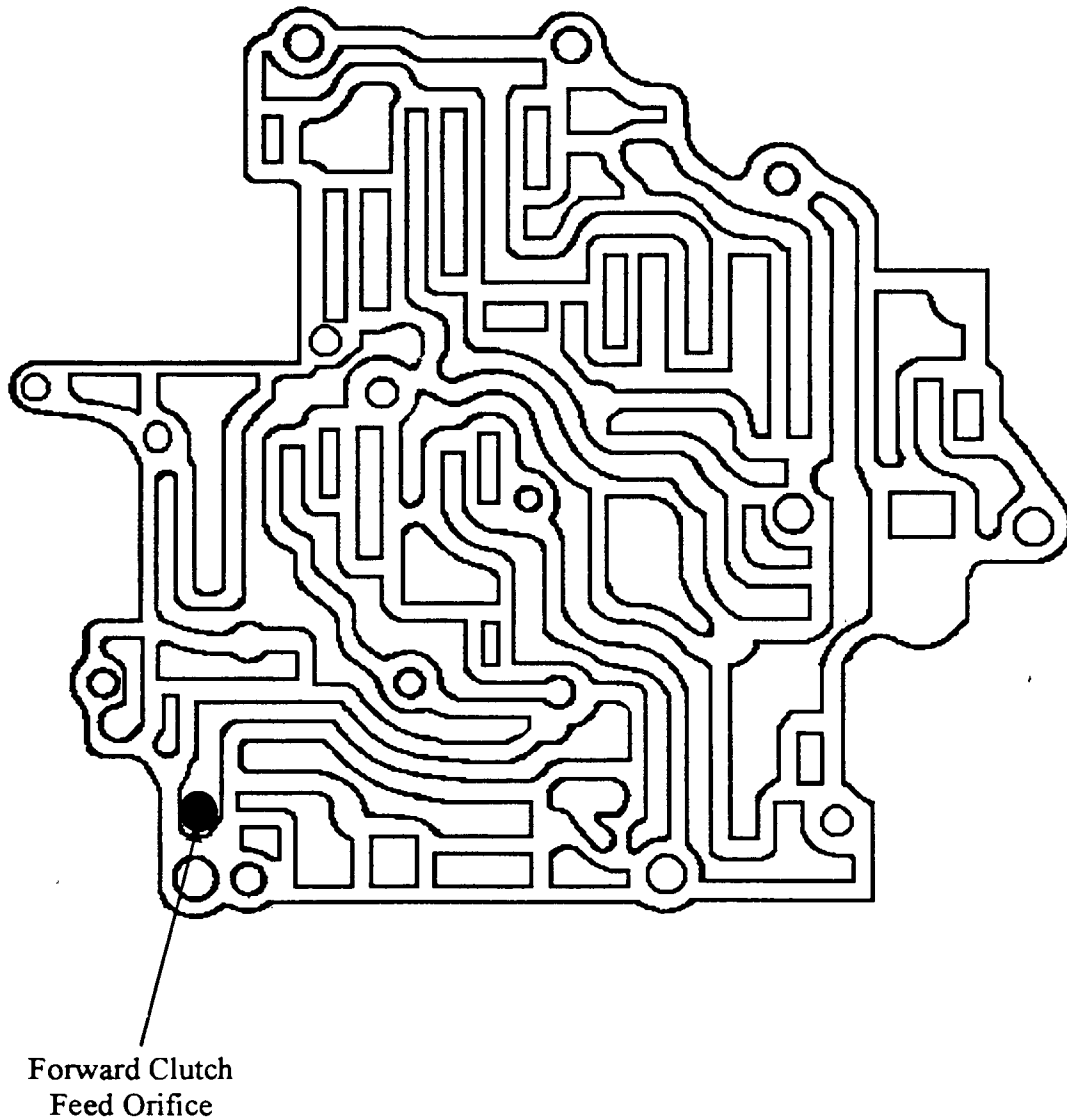


Figure 82

3N71B
VALVE BODY
CHECK BALL LOCATION

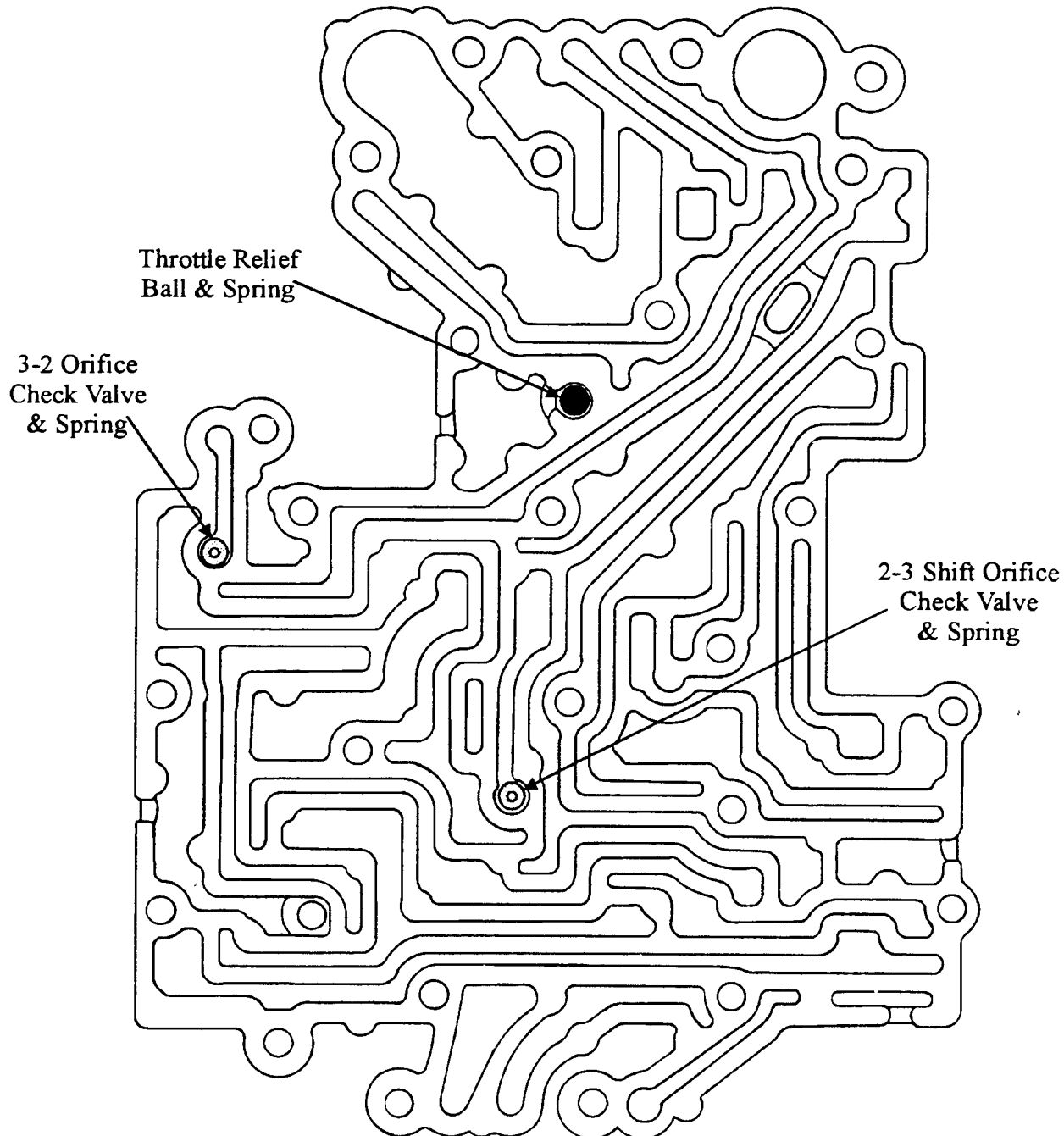


Figure 83

4N71B
VALVE BODY
CHECK BALL LOCATION

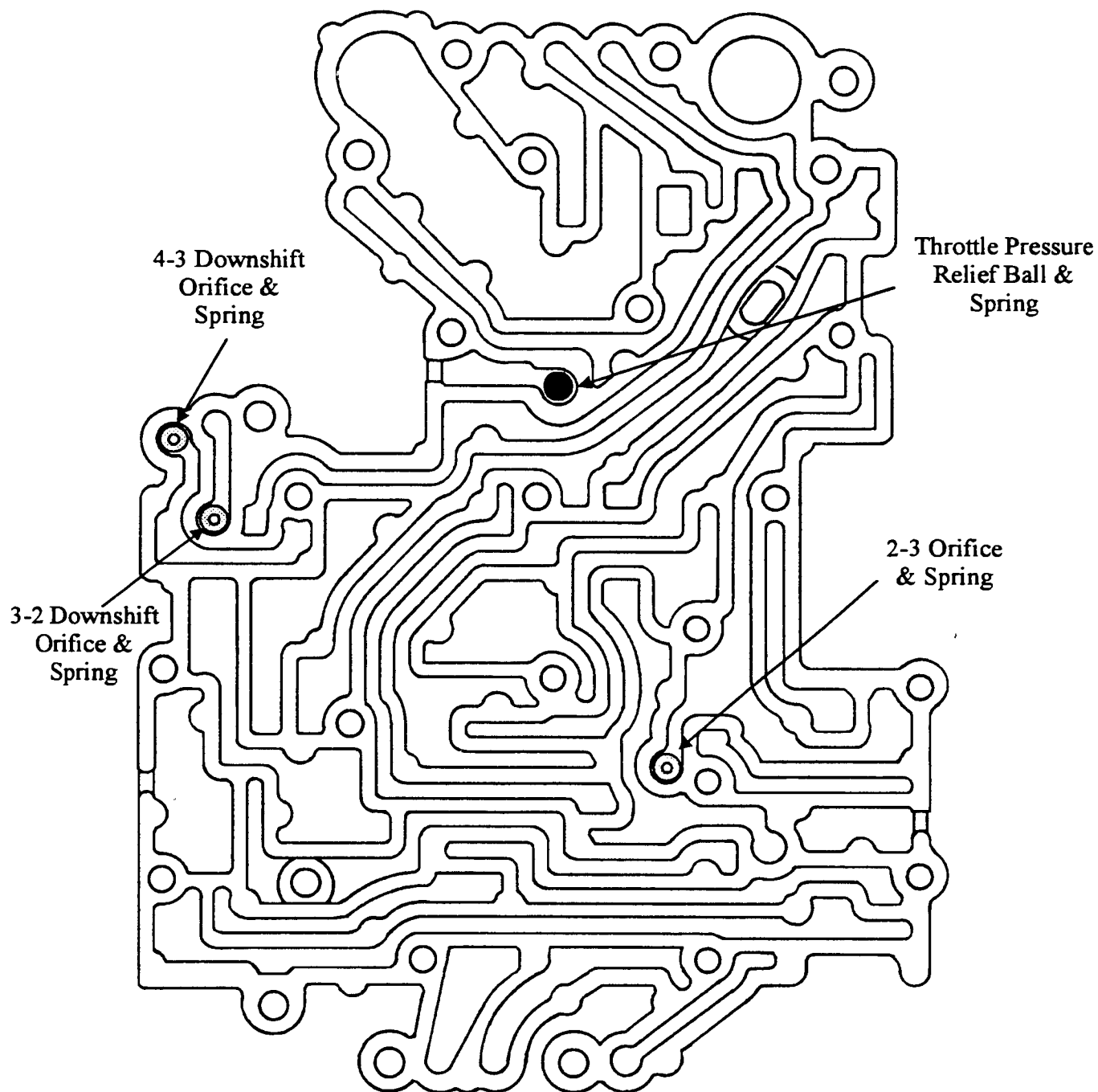


Figure 84

4N71B
OD CASE
CHECK BALL LOCATION

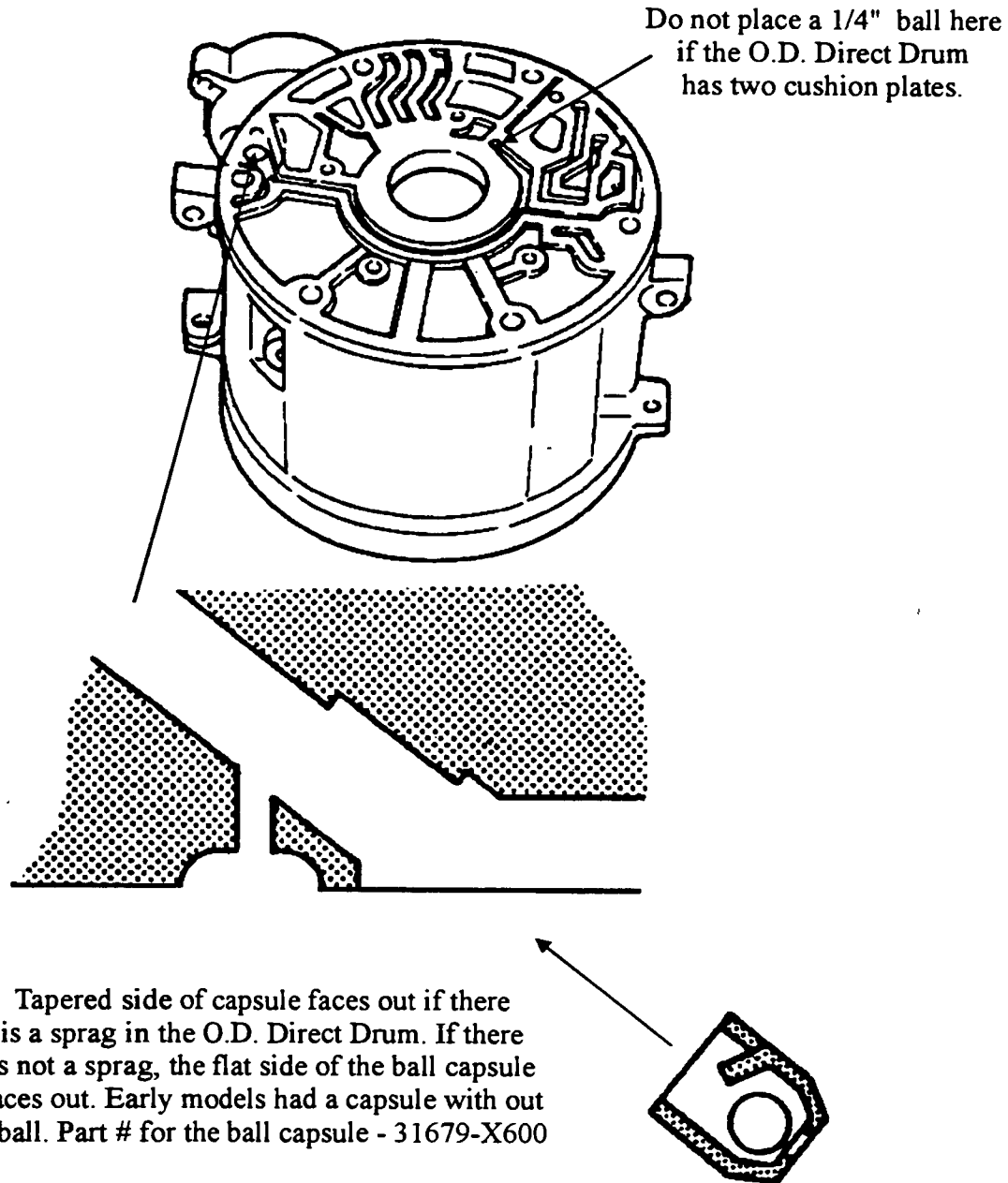


Figure 85

G4A-HL
REAR CONTROL BODY
ORIFICE & CHECK BALL LOCATION

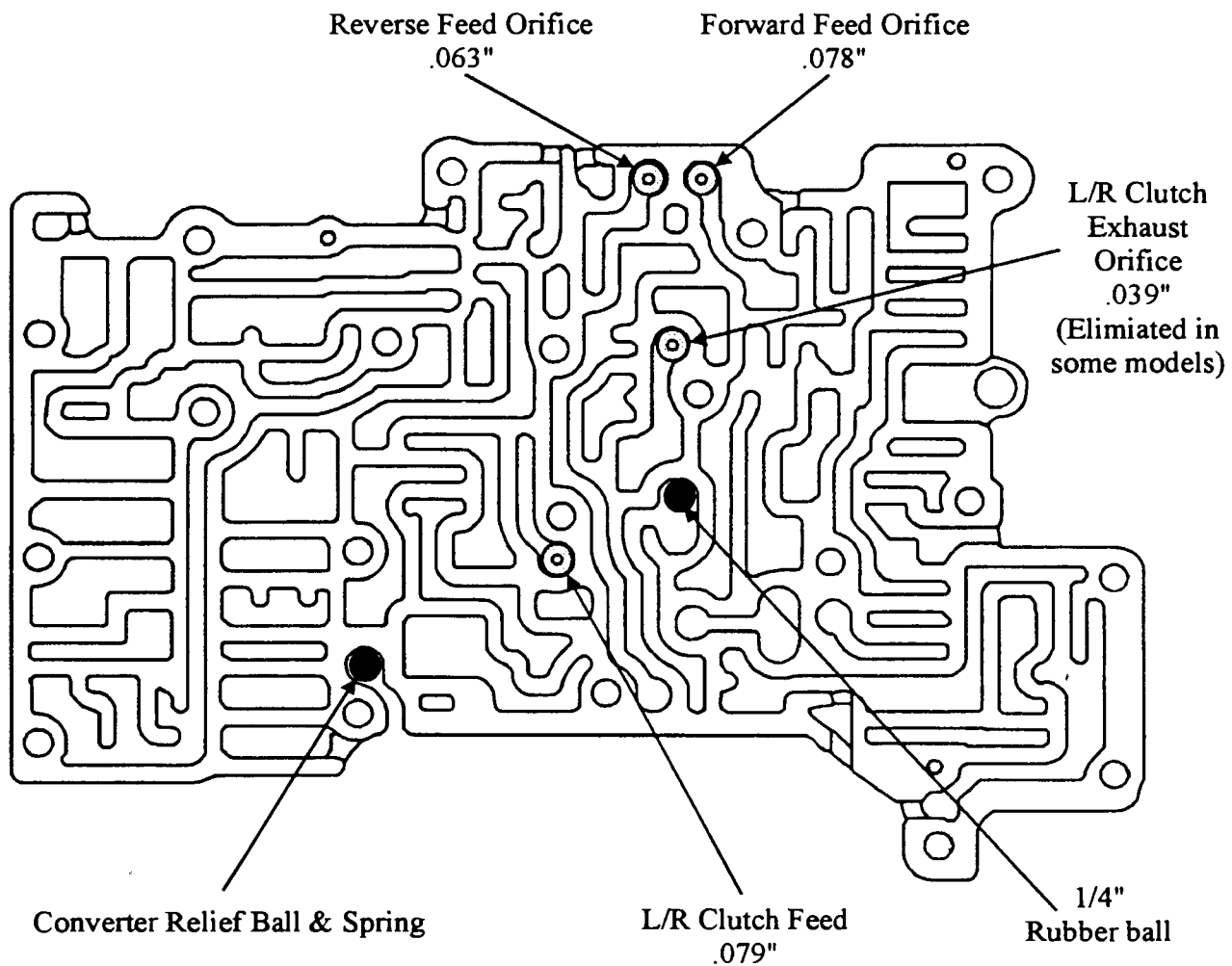


Figure 86

G4A-HL
MAIN CONTROL VALVE BODY
ORIFICE & CHECK BALL LOCATION

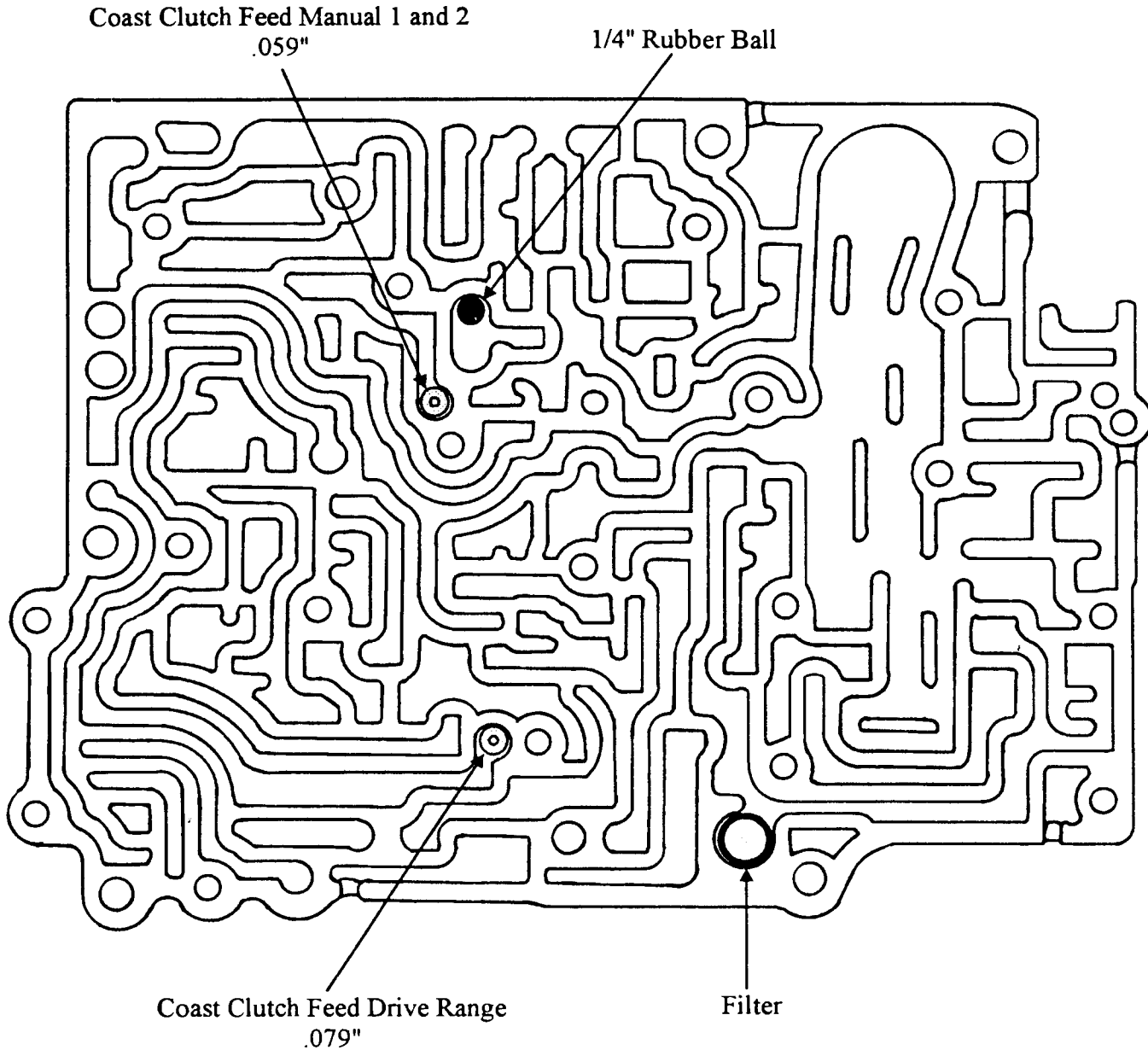


Figure 87

G4A-HL
MAIN CONTROL VALVE BODY
CHECK BALL LOCATION

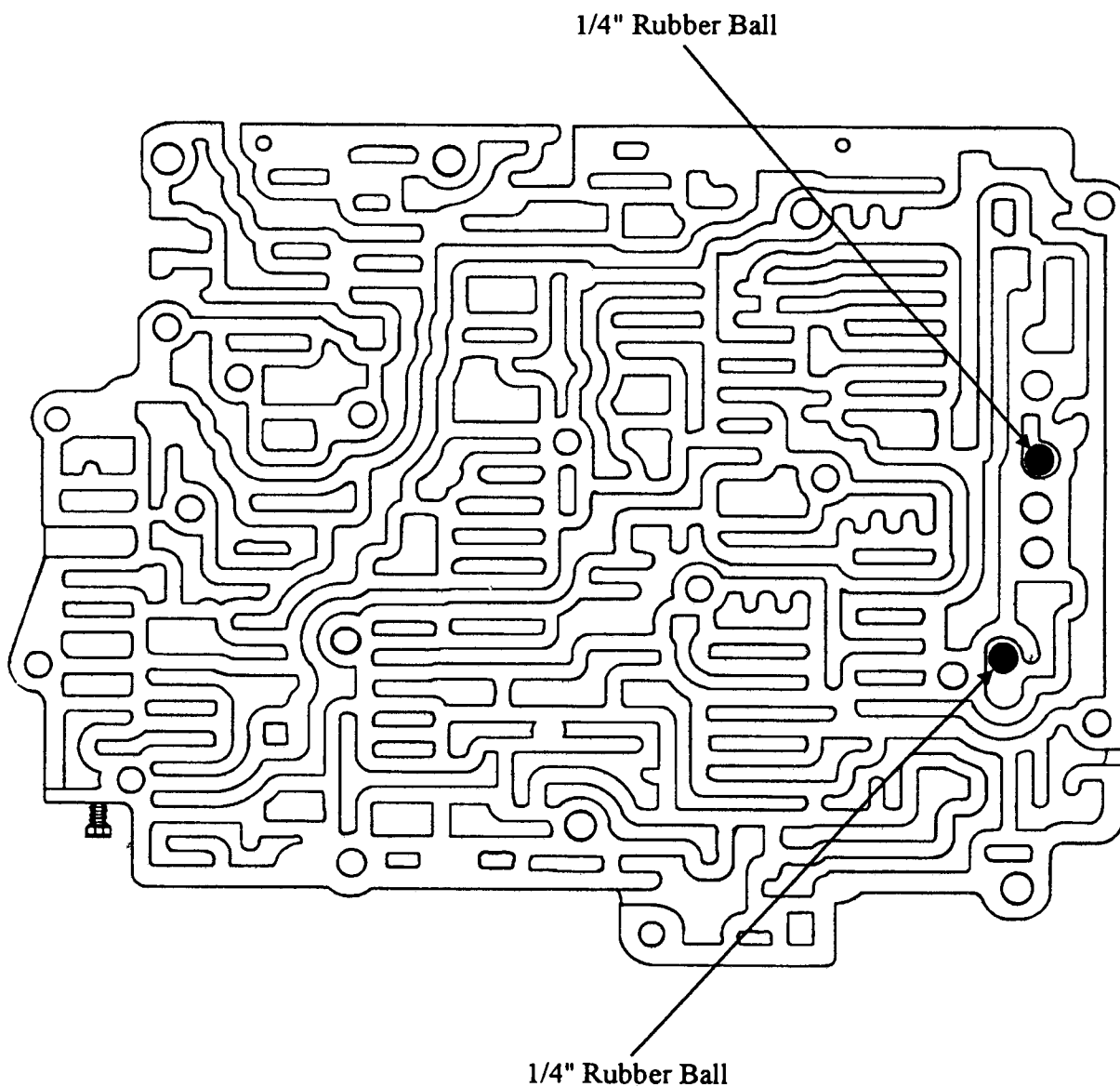


Figure 88

G4A-HL
PREMAIN VALVE BODY
ORIFICE & CHECK BALL LOCATION

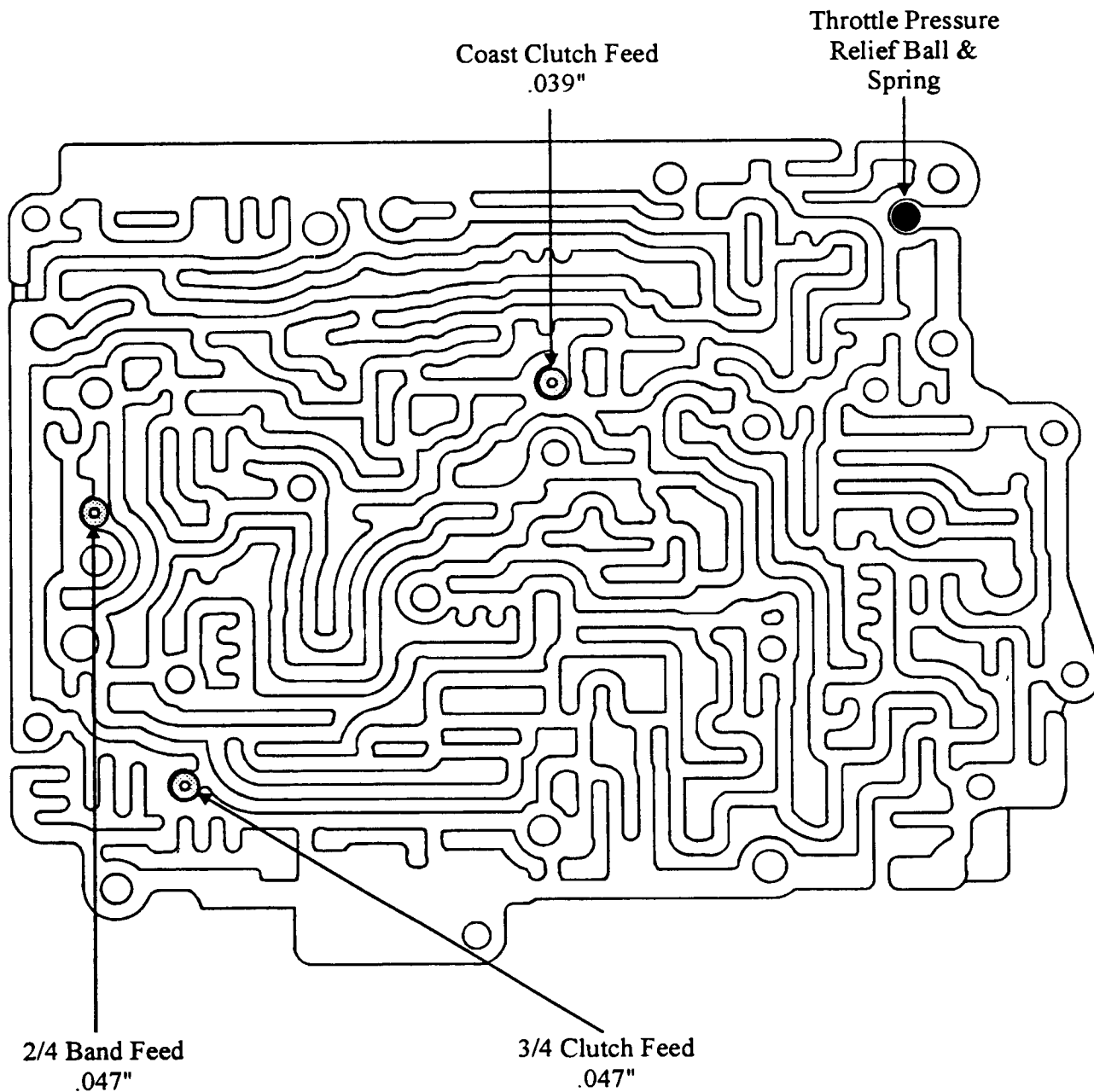


Figure 89

G4A-HL
PREMAIN VALVE BODY
CHECK BALL LOCATION

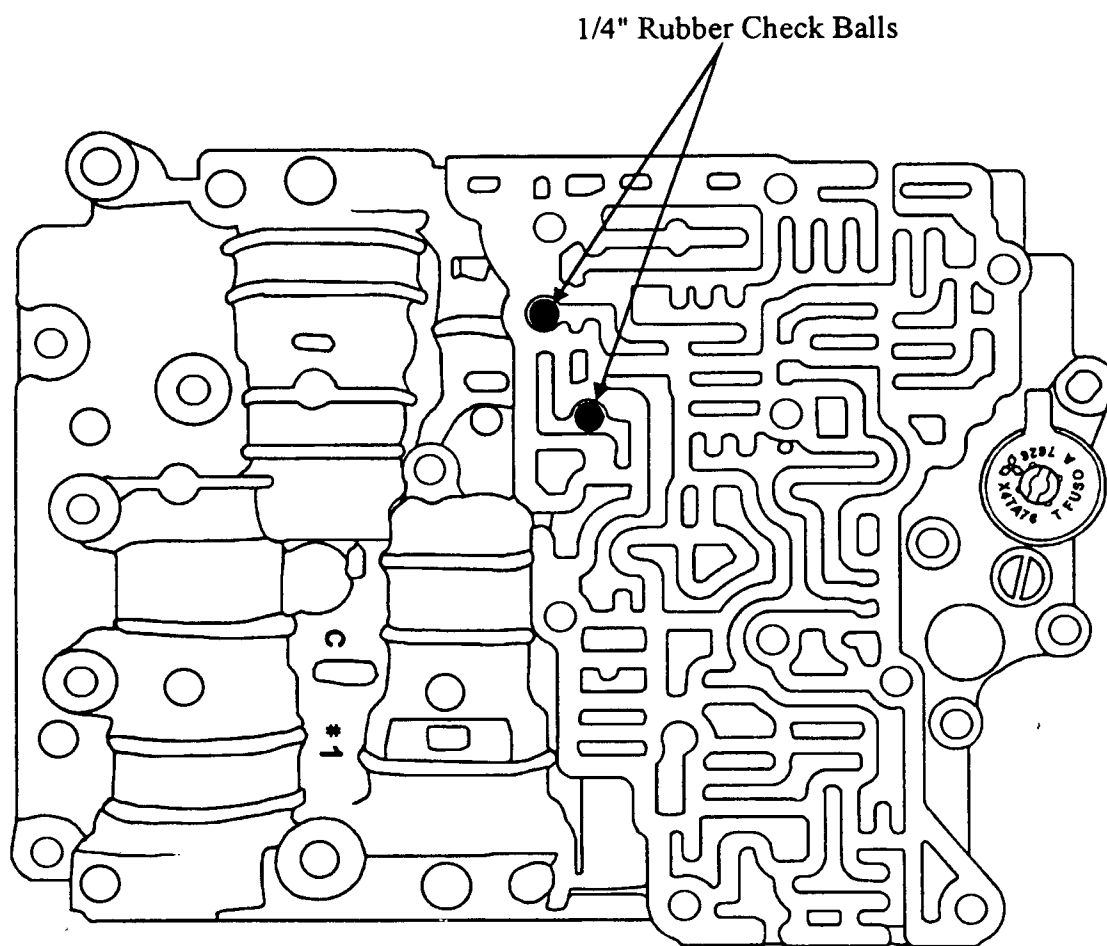
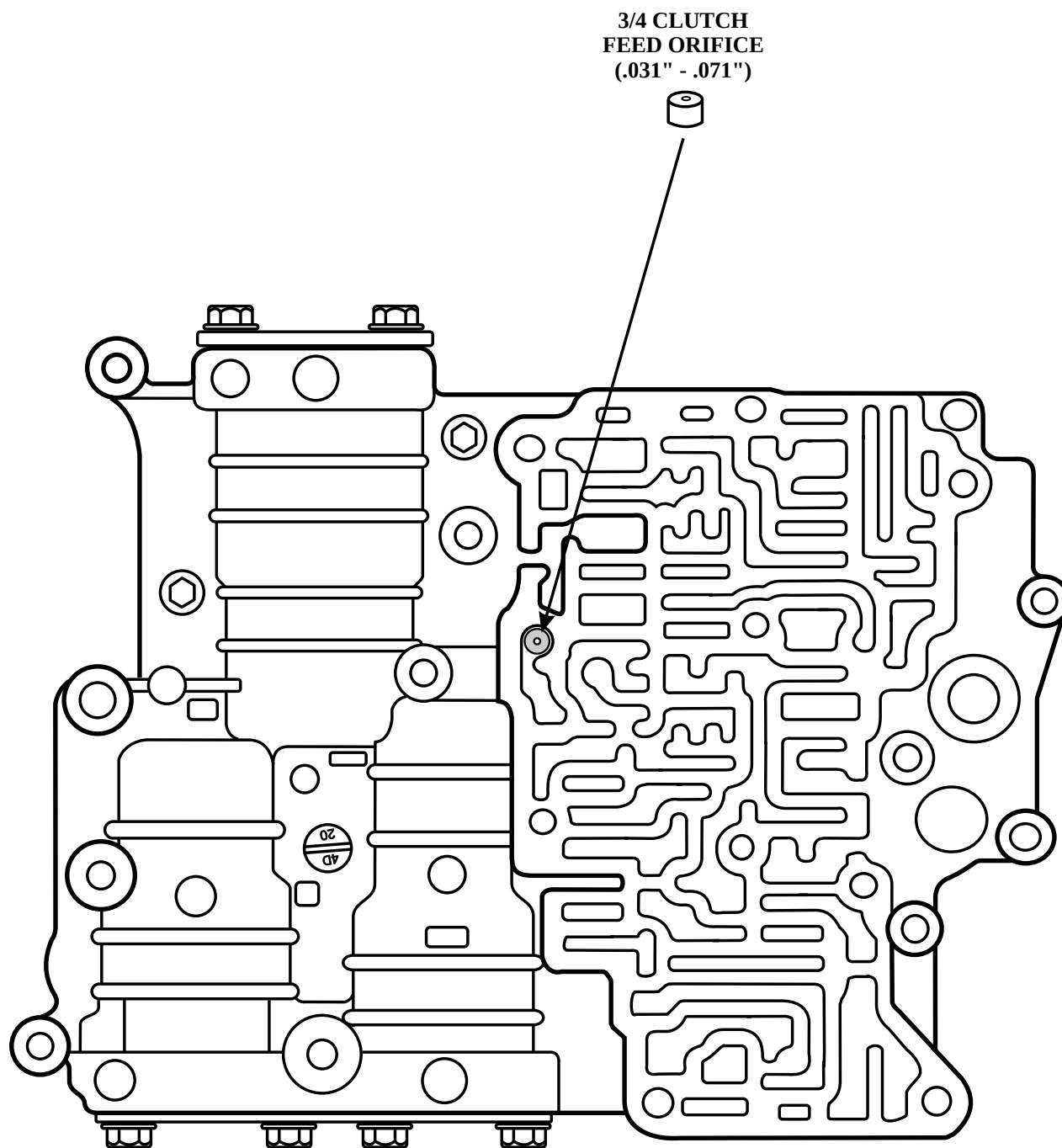
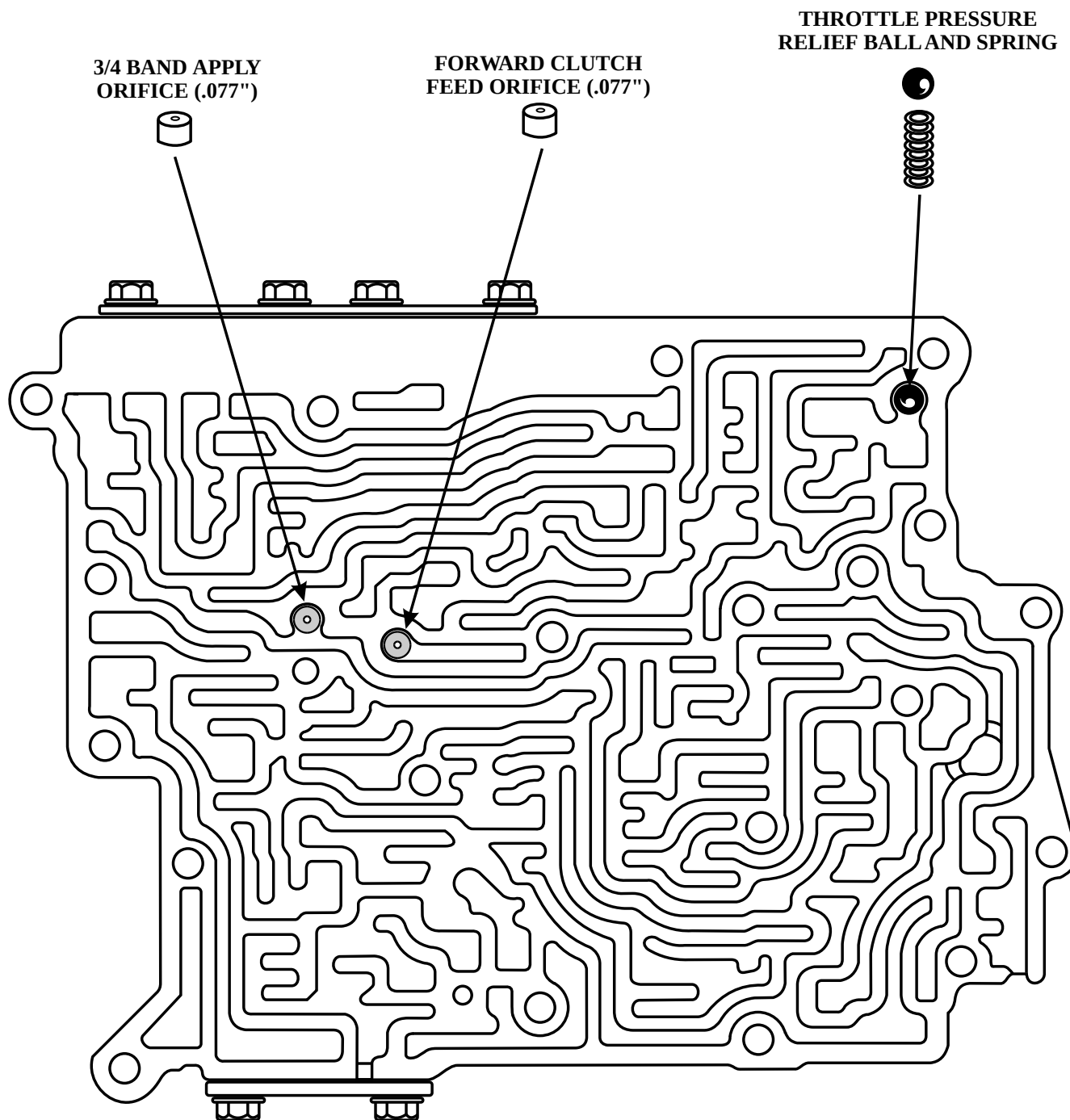


Figure 90

FORD G4A-EL PREMAIN VALVE BODY "COVER SIDE"

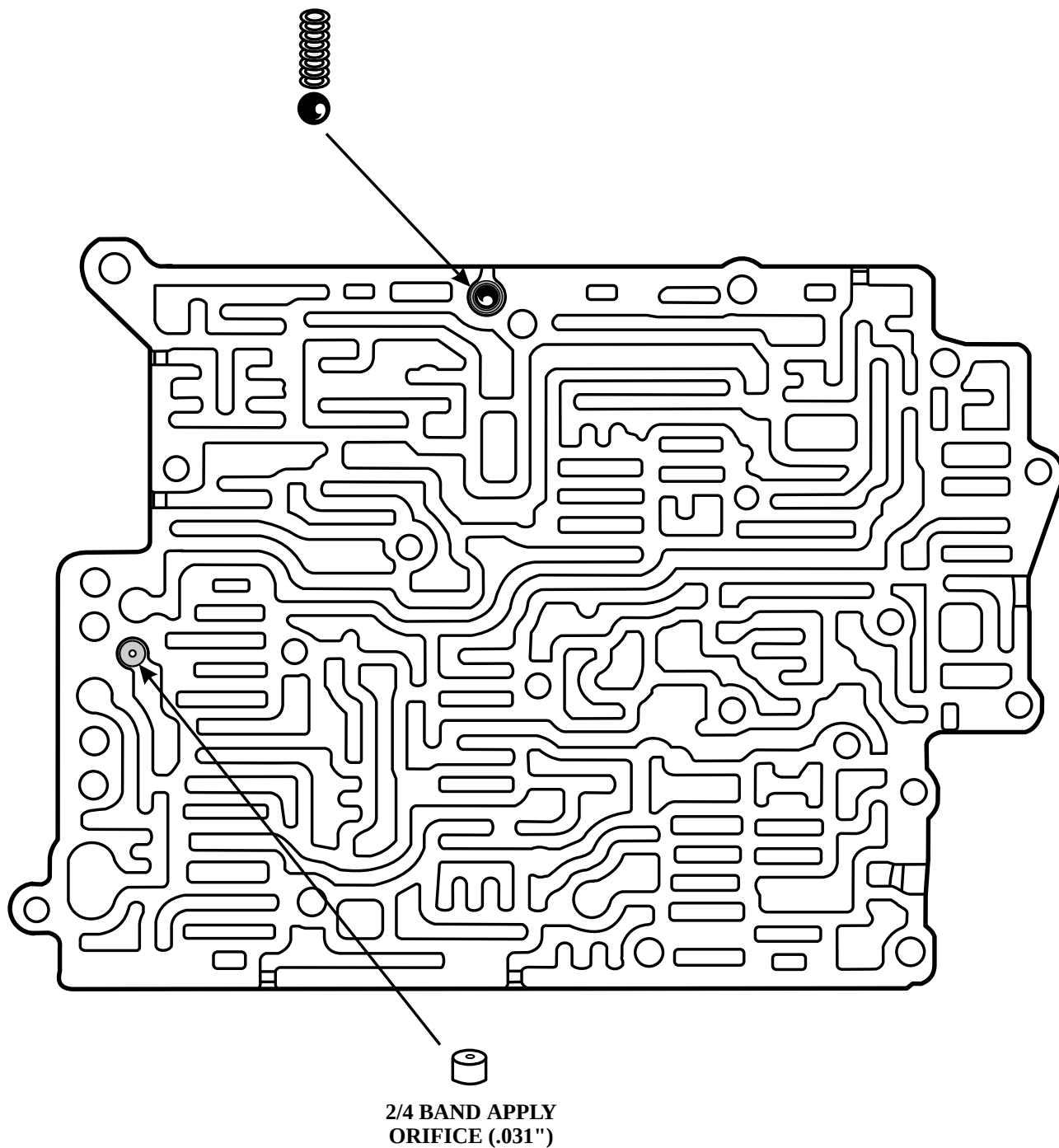


FORD G4A-EL PREMAIN VALVE BODY "MAIN BODY SIDE"



FORD G4A-EL MAIN VALVE BODY "PREMAIN BODY SIDE"

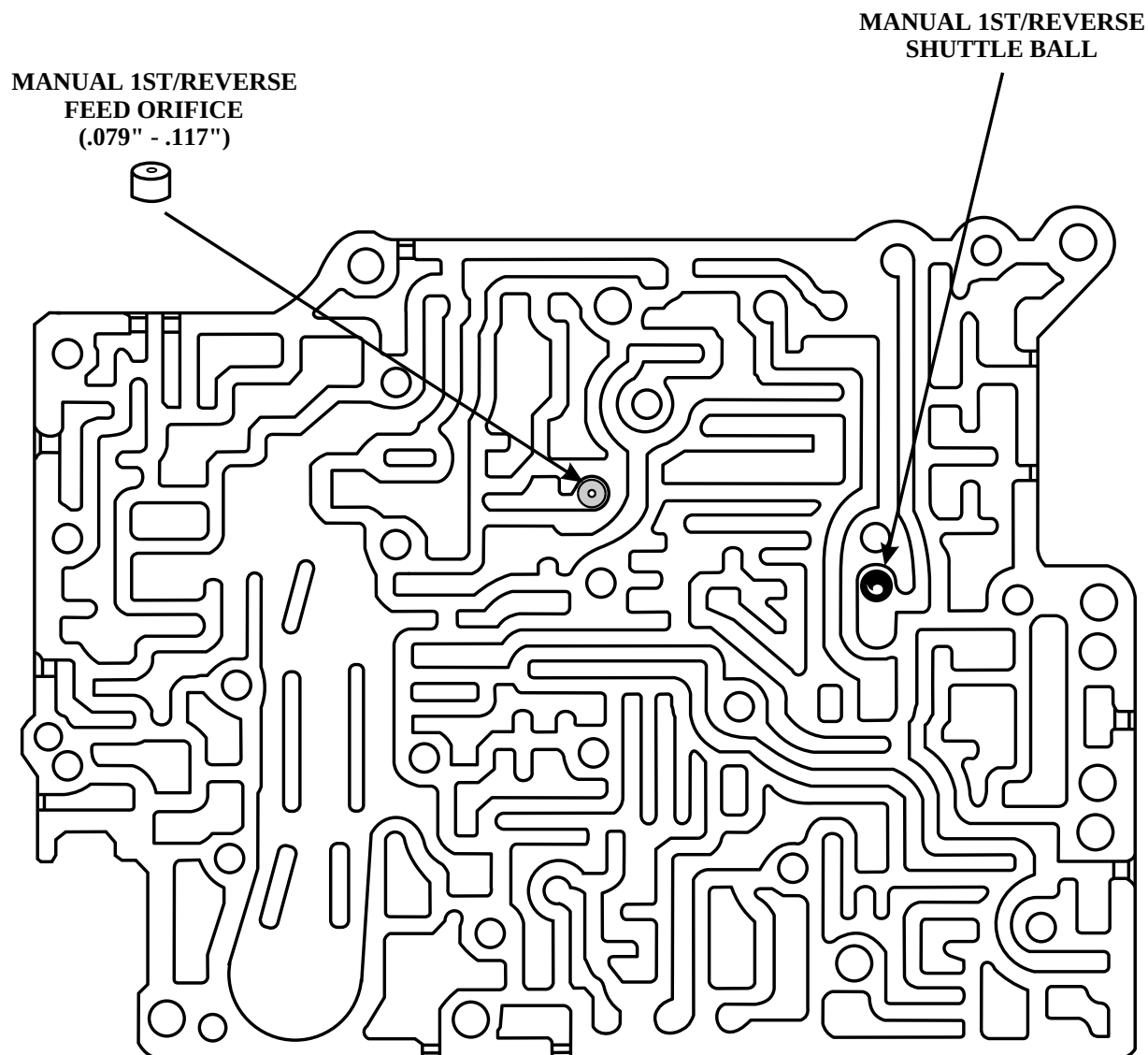
CONVERTER PRESSURE
RELIEF BALL AND SPRING
(Ball Down First)



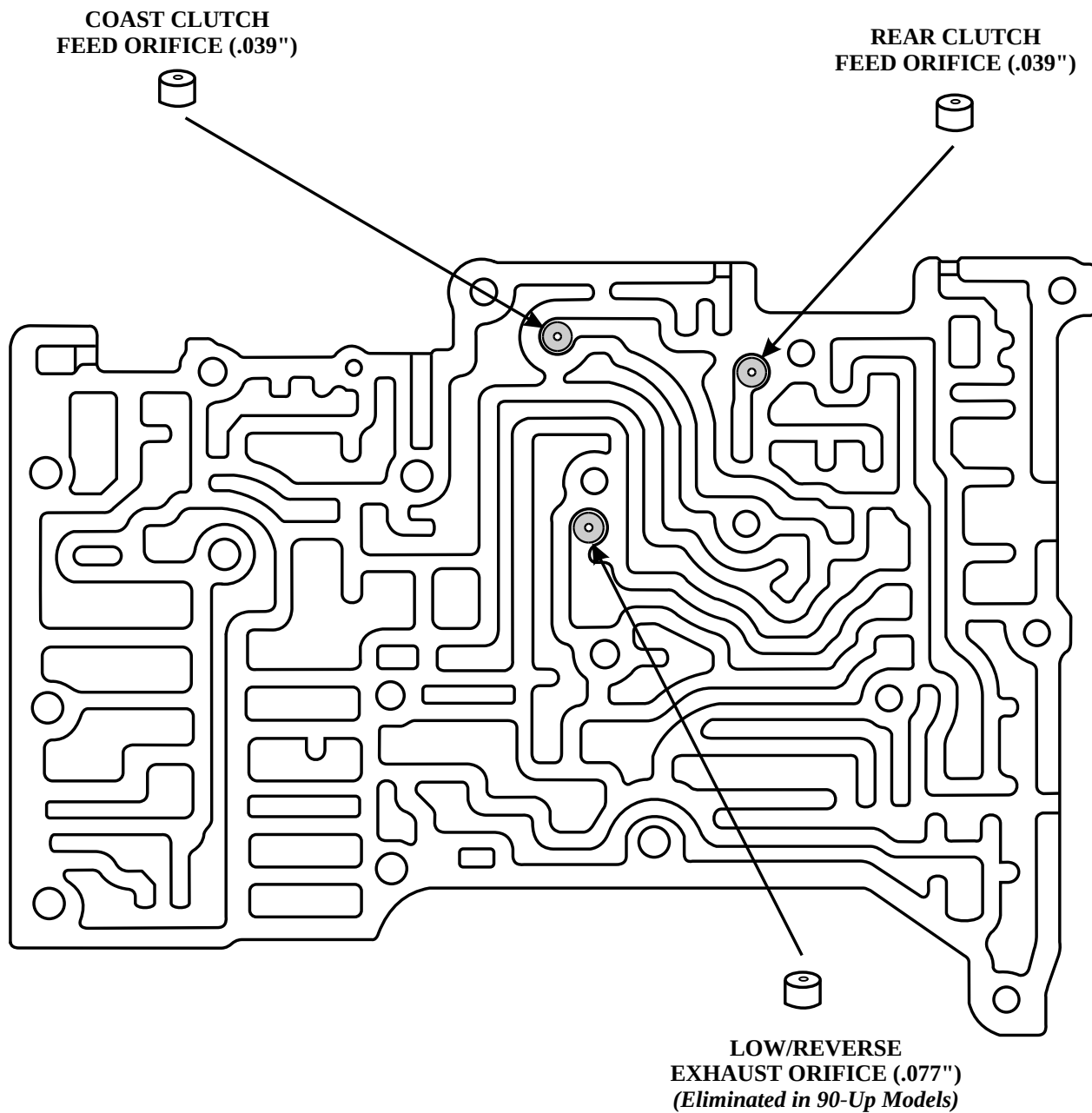
Copyright © 2002 ATSG

Figure 93

FORD G4A-EL MAIN VALVE BODY "REAR BODY SIDE"



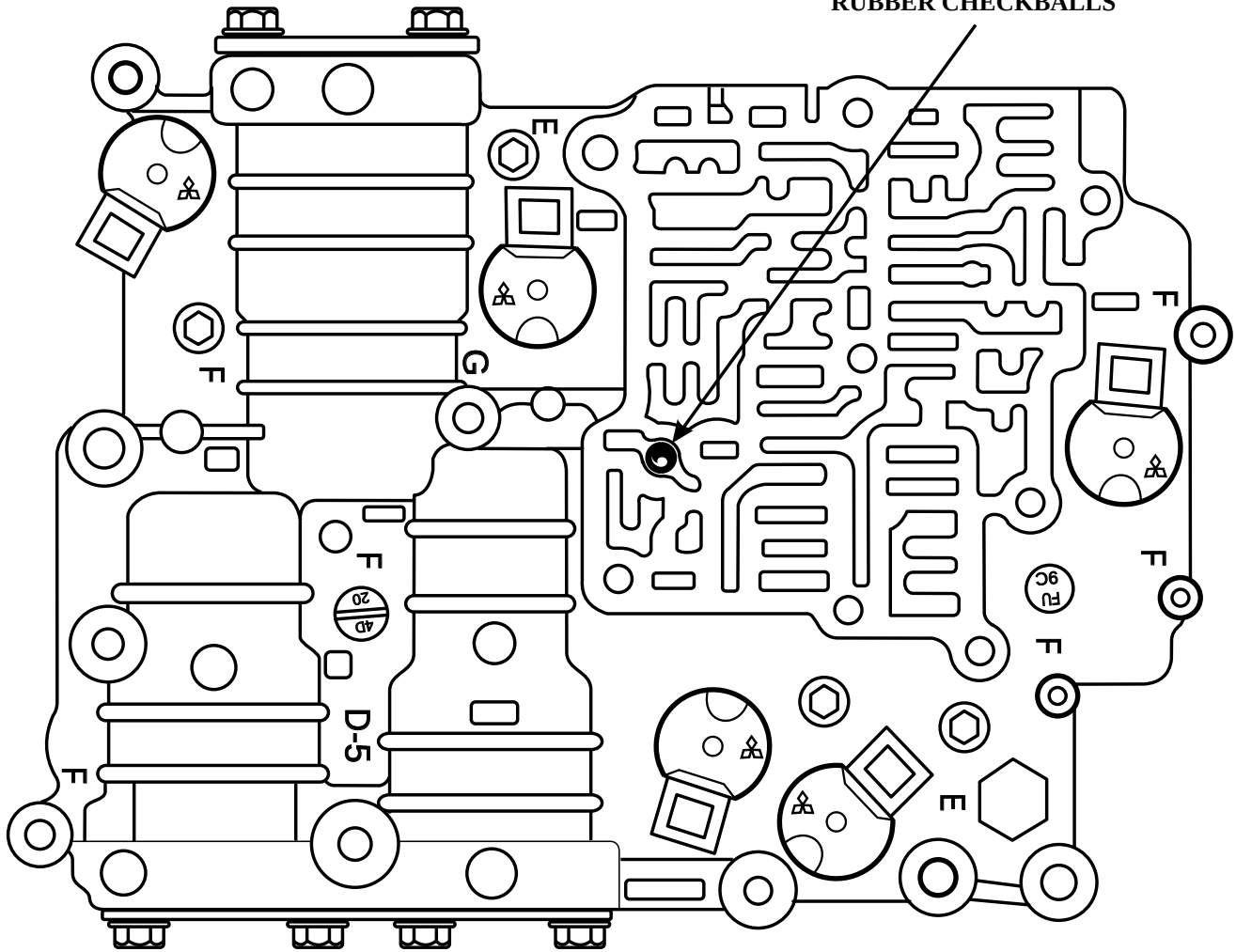
FORD G4A-EL REAR VALVE BODY



Copyright © 2002 ATSG

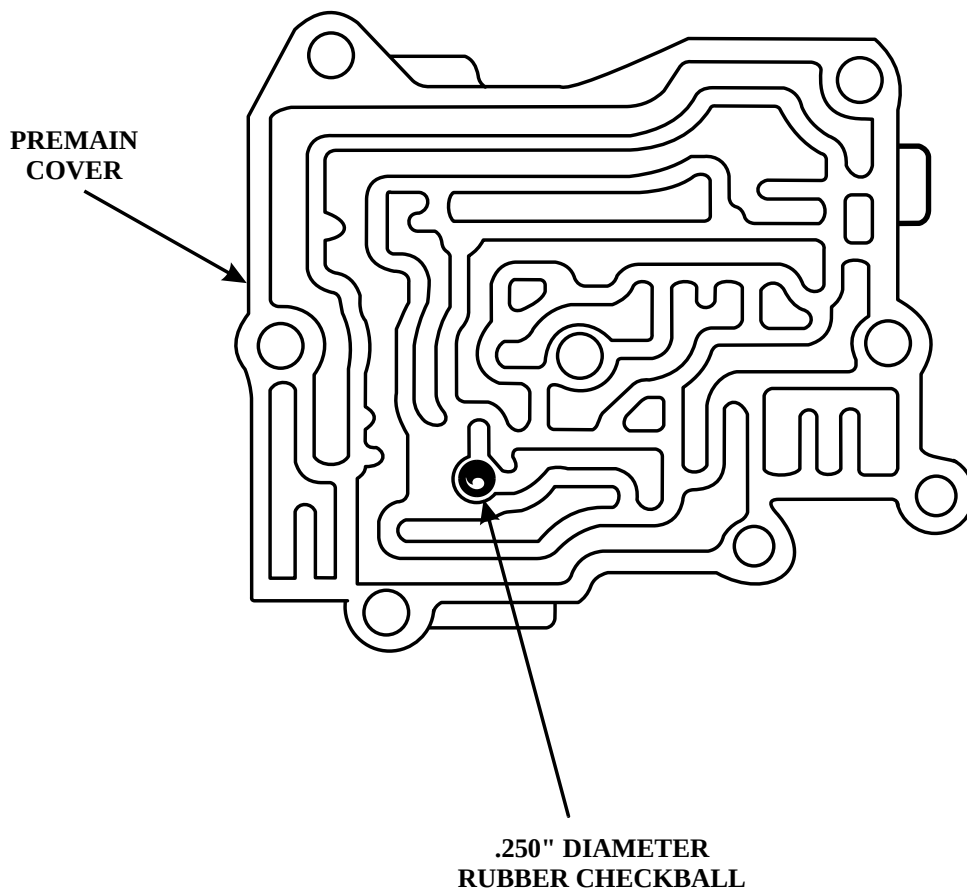
Figure 95

**.250" DIAMETER
RUBBER CHECKBALLS**

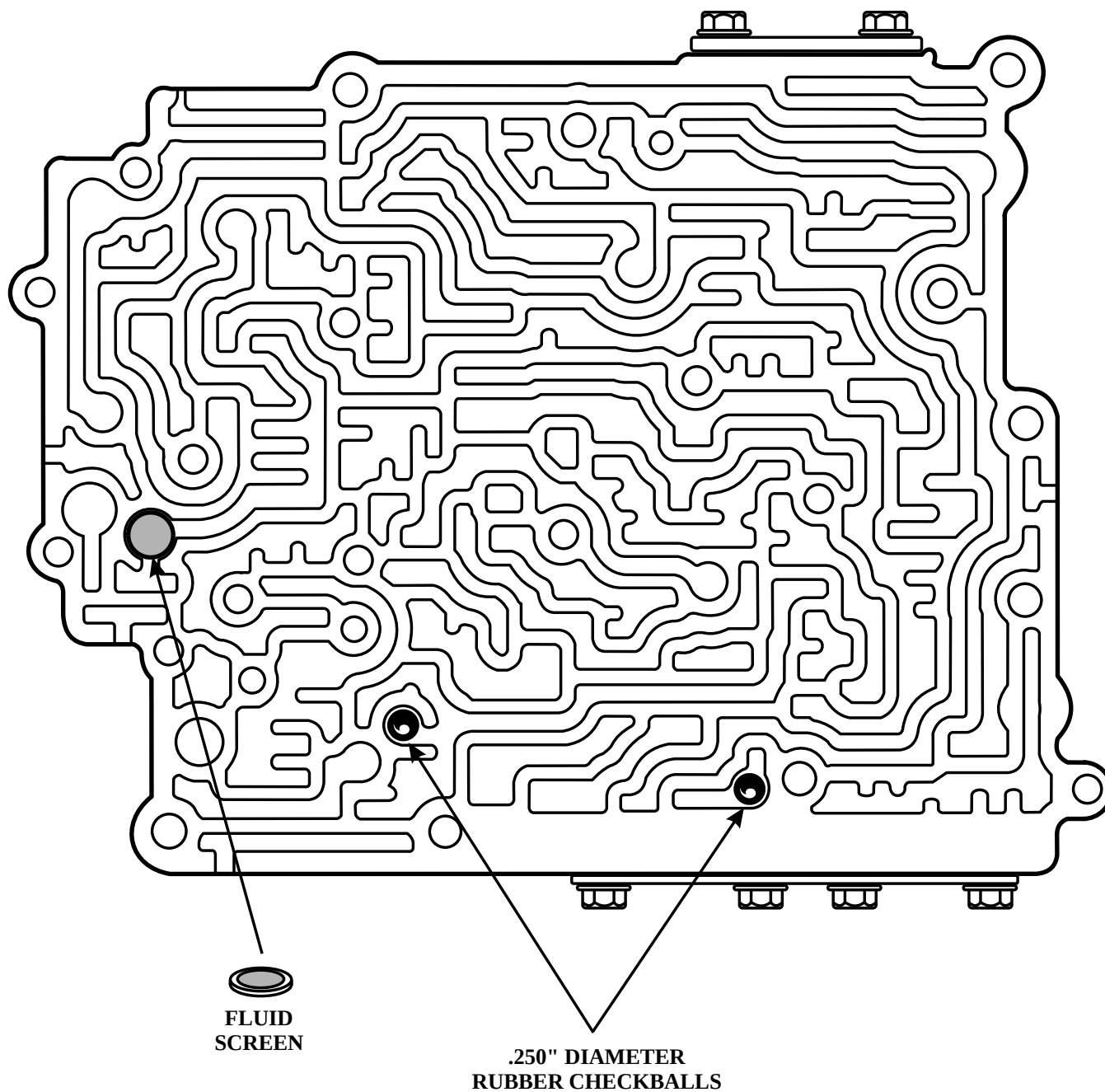


99

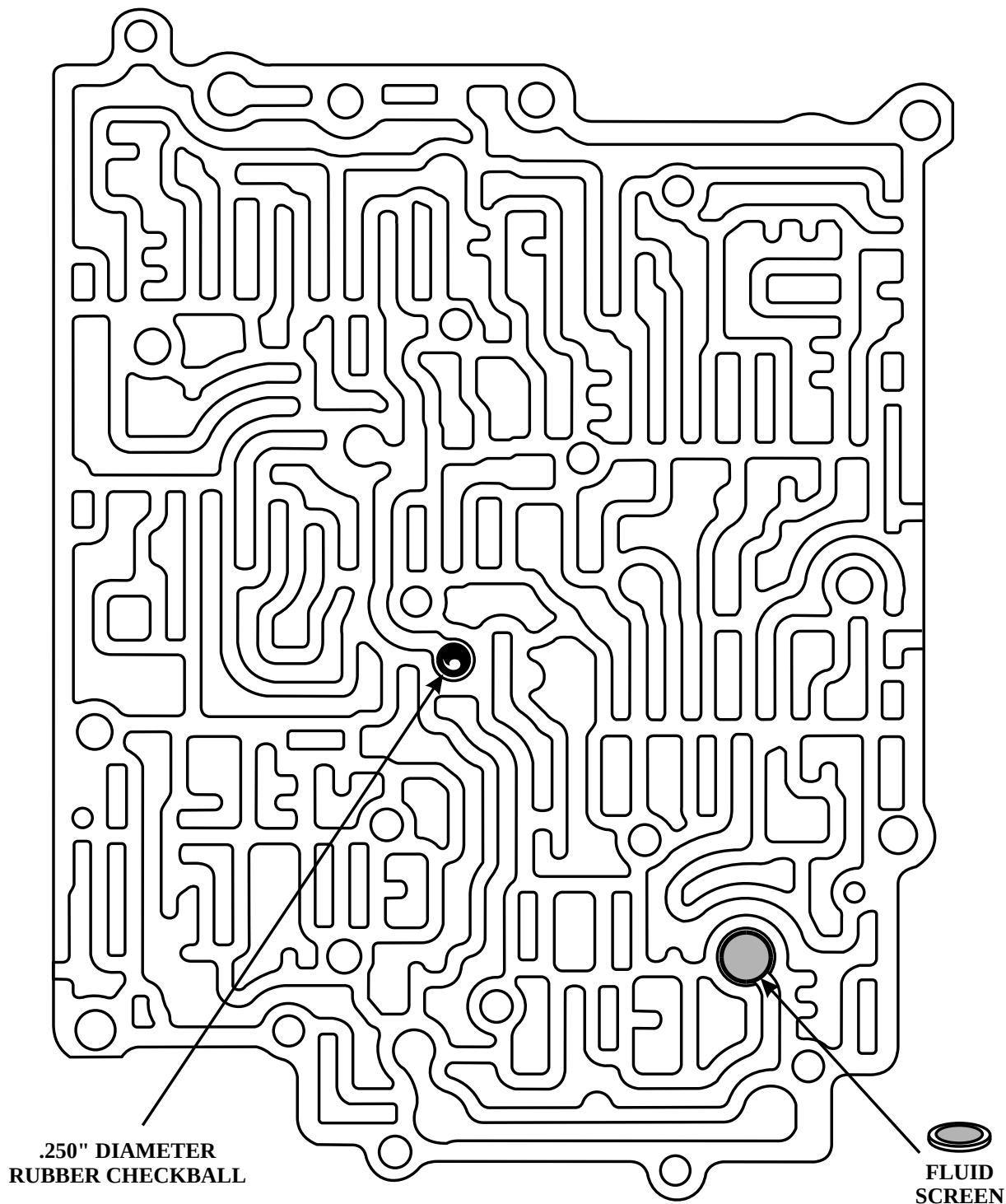
FORD GF4A-EL PREMAIN VALVE BODY COVER



FORD GF4A-EL PREMAIN VALVE BODY "MAIN BODY SIDE"



FORD GF4A-EL MAIN VALVE BODY "PREMAIN BODY SIDE"



Copyright © 2002 ATSG

Figure 99

FORD GF4A-EL MAIN VALVE BODY "REAR BODY SIDE"

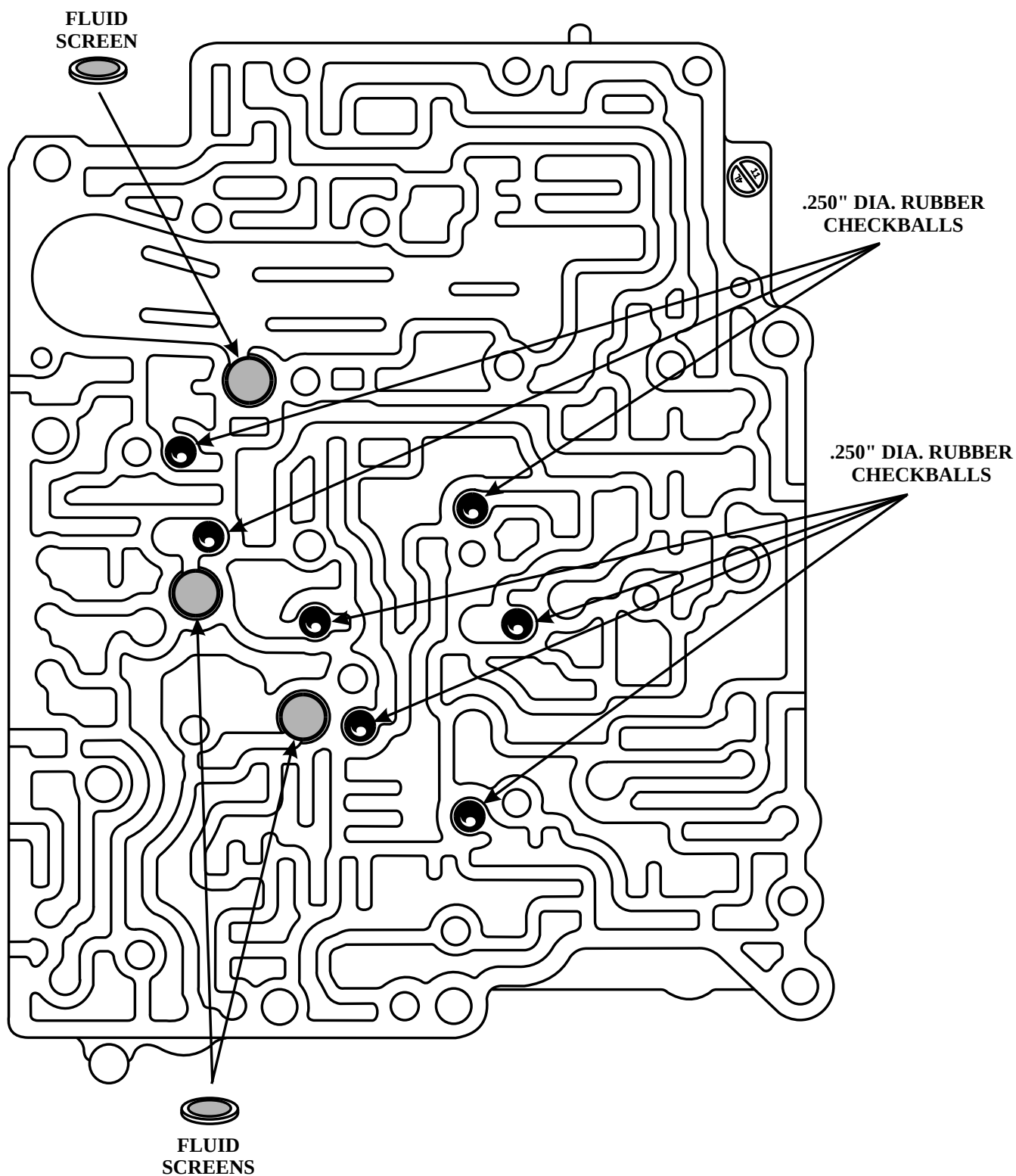
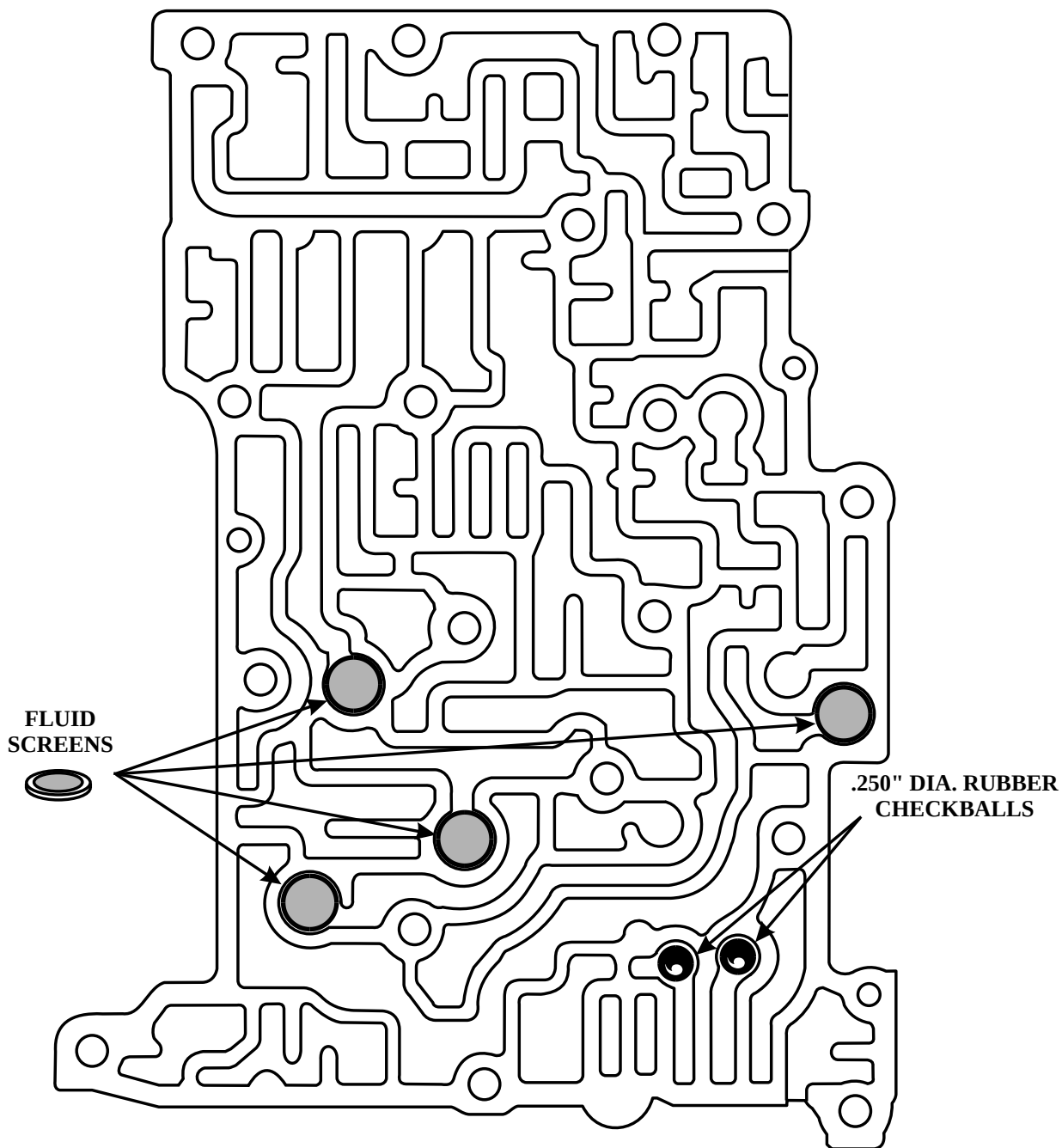


Figure 100

FORD GF4A-EL REAR VALVE BODY "MAIN BODY SIDE"



Copyright © 2002 ATSG

Figure 101

F-4EAT
MAIN VALVE BODY
CHECK BALL LOCATION

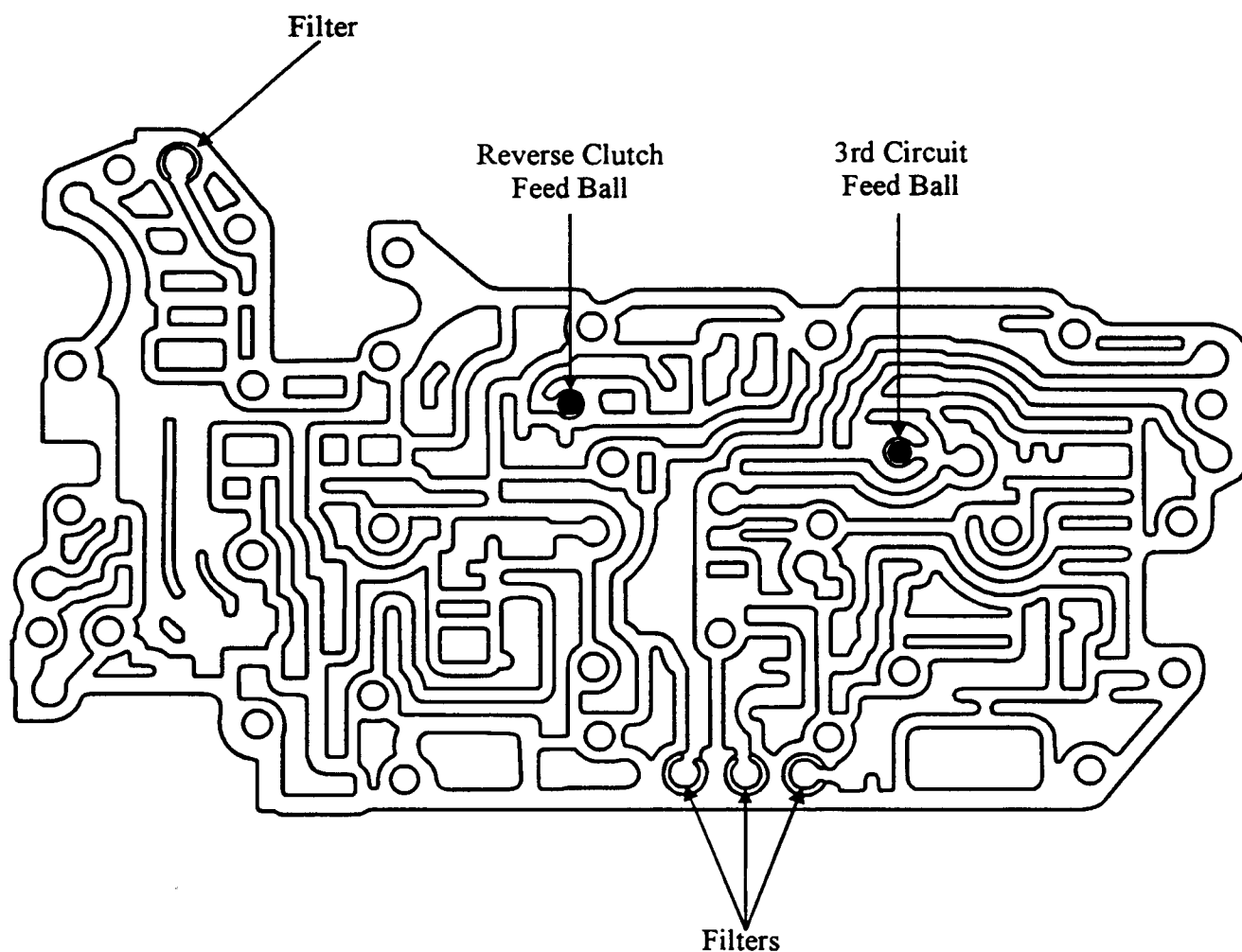


Figure 102

F-4EAT
THROTTLE & LOWER VALVE BODY
CHECK BALL LOCATION

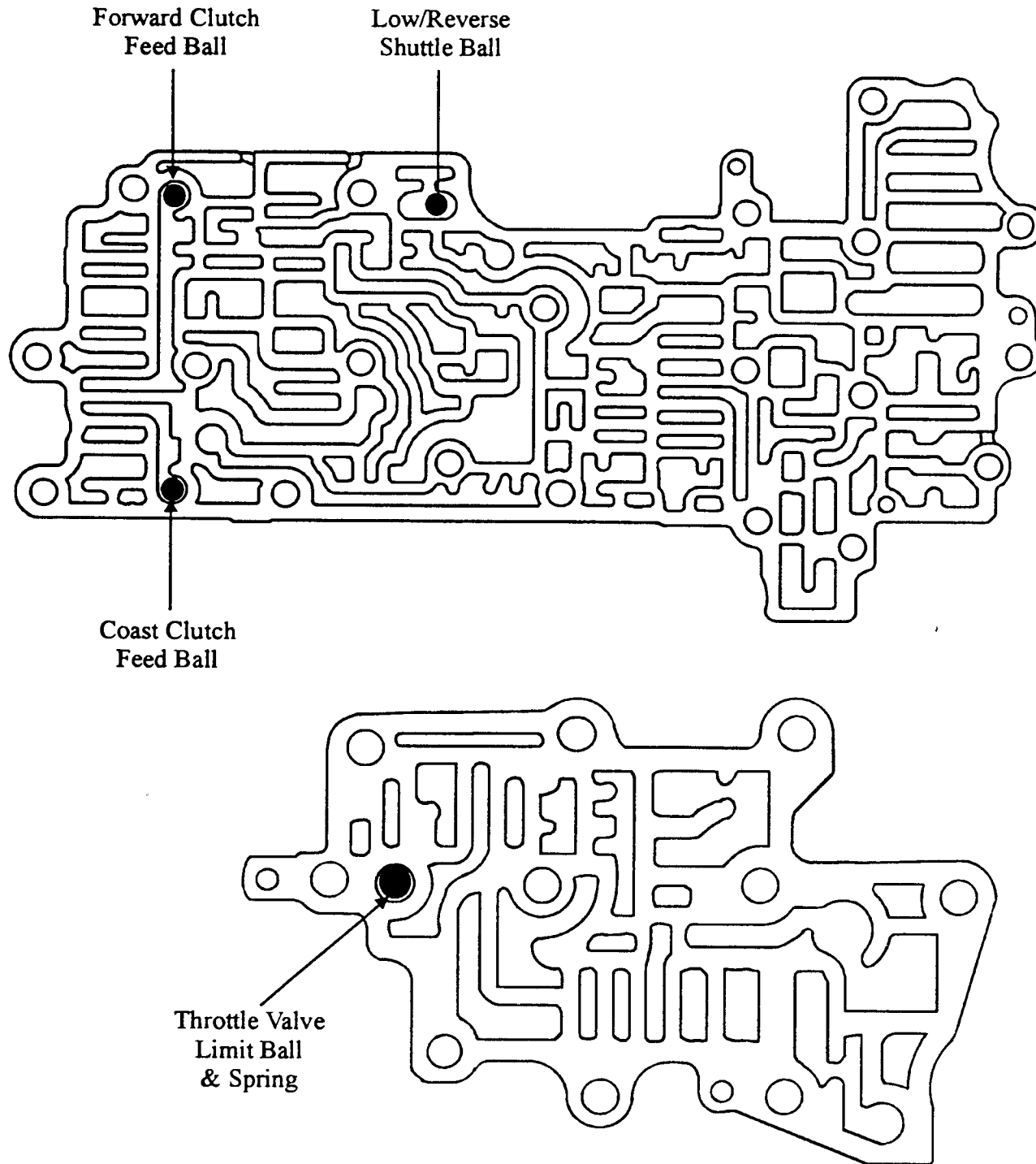


Figure 103

KM 171
MAIN VALVE BODY
CHECK BALL LOCATION

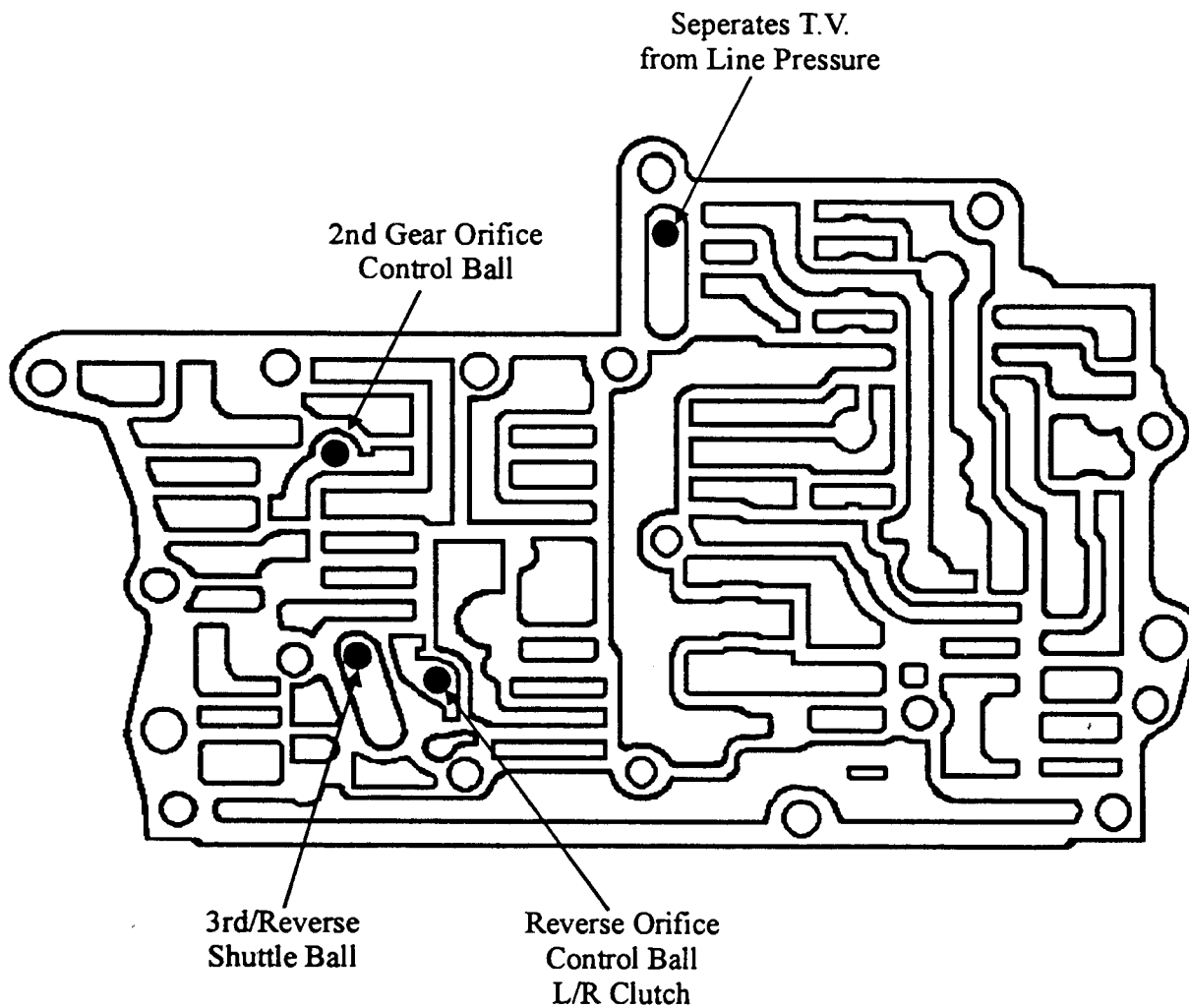


Figure 104

KM 171
LOWER VALVE BODY
CHECK BALL LOCATION

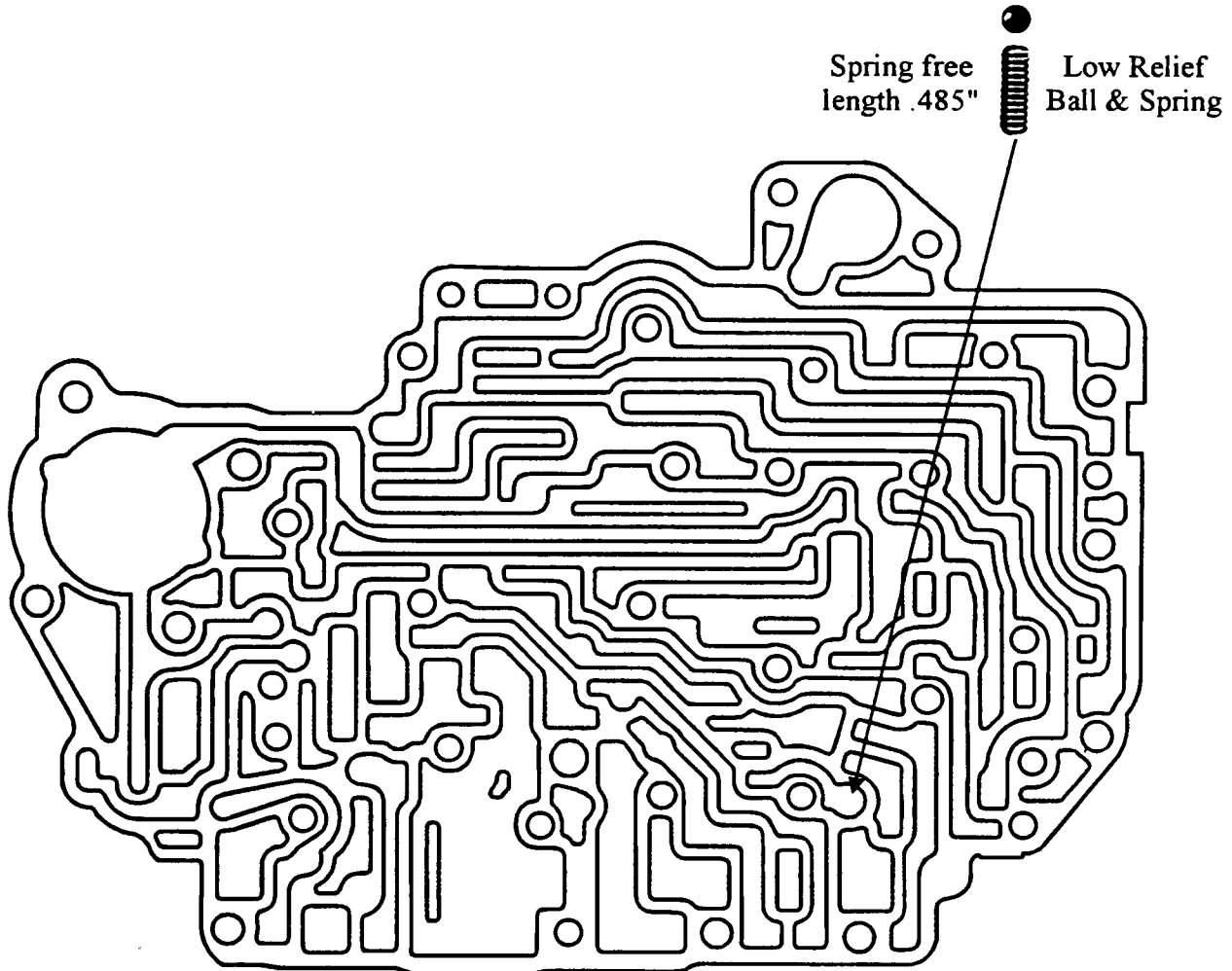


Figure 105

KM 171
LOWER VALVE BODY
CHECK BALL LOCATION

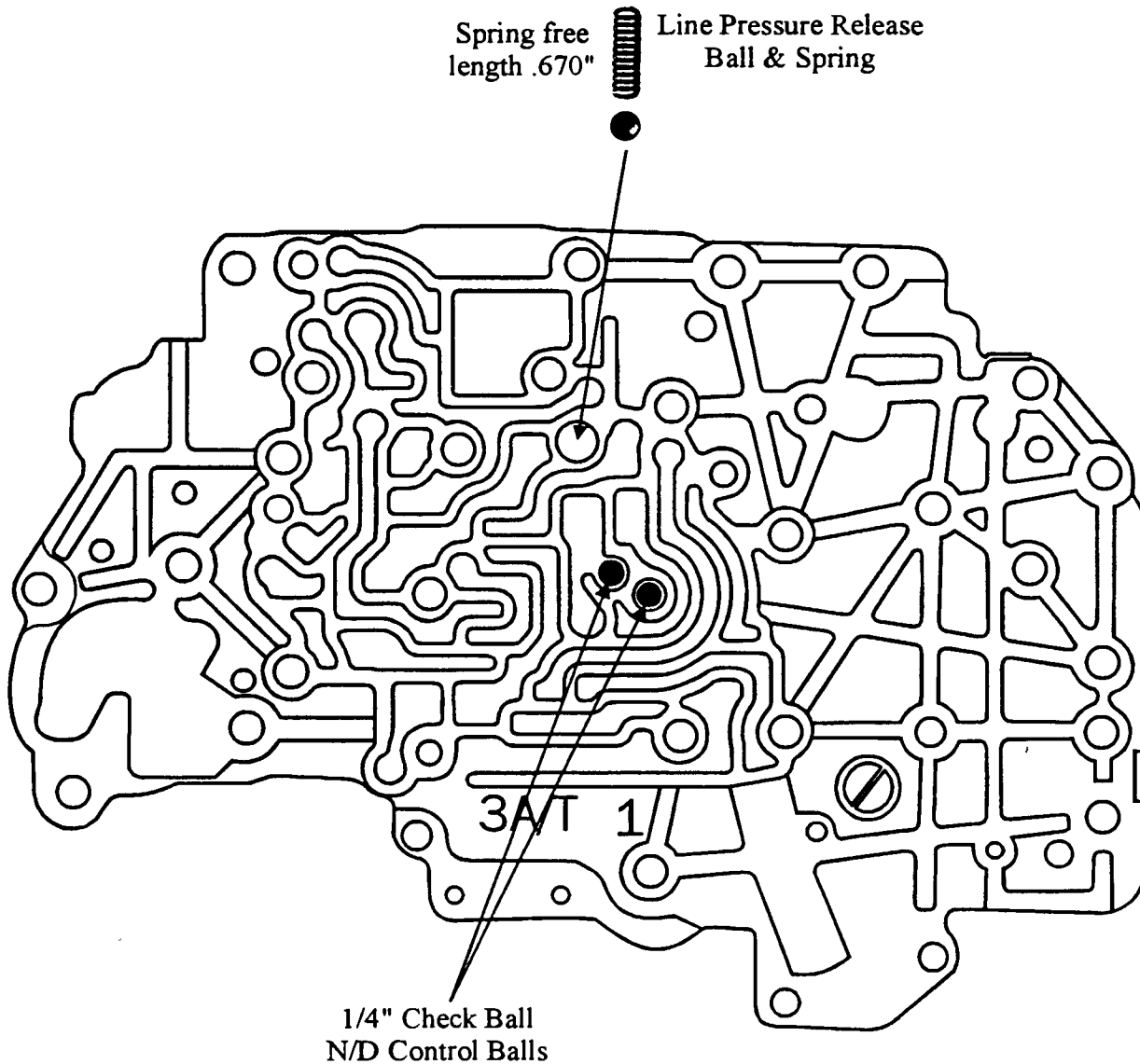


Figure 106

KM 175
MAIN VALVE BODY
CHECK BALL LOCATION

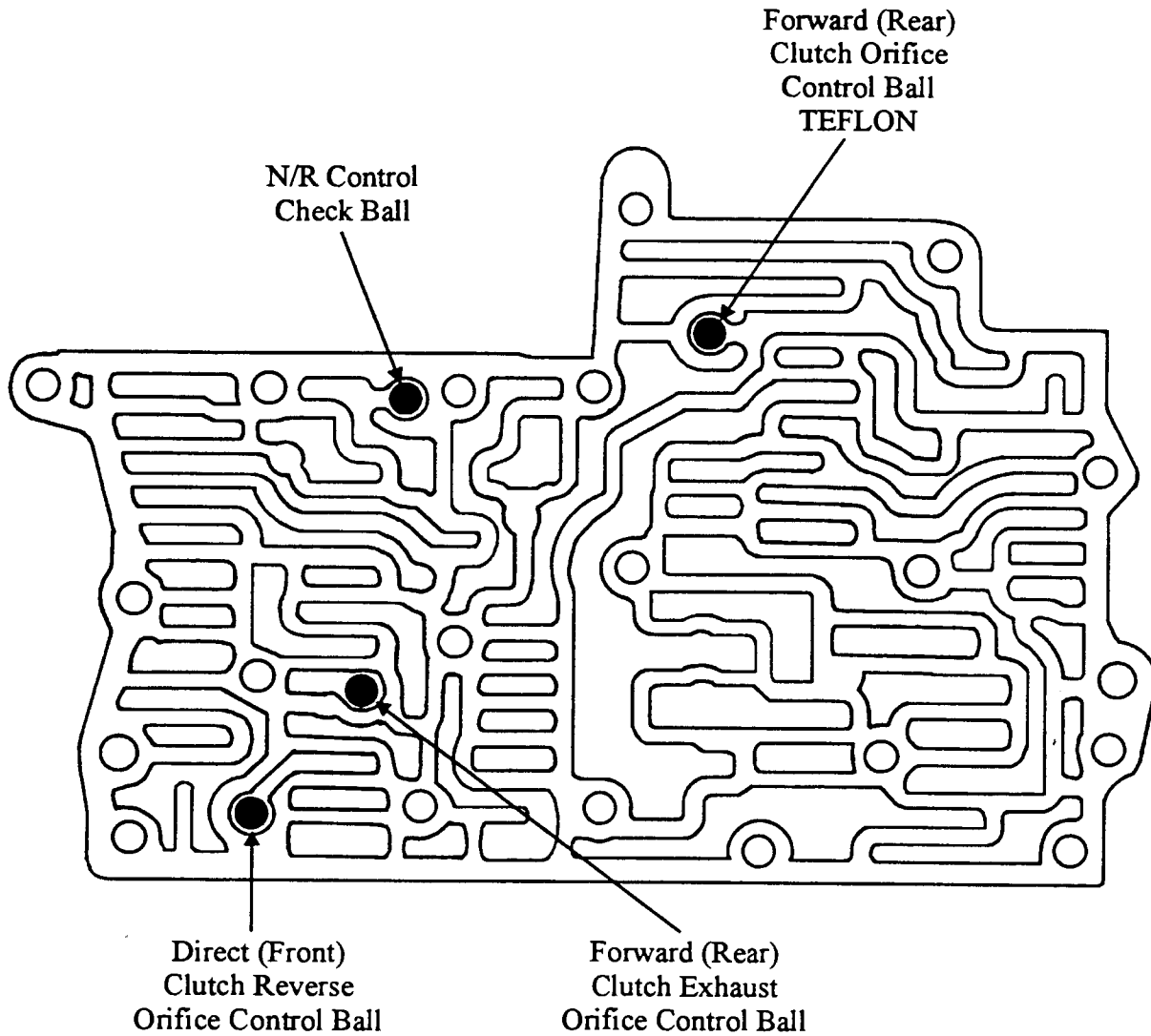


Figure 107

KM 175
UPPER VALVE BODY
CHECK BALL LOCATION

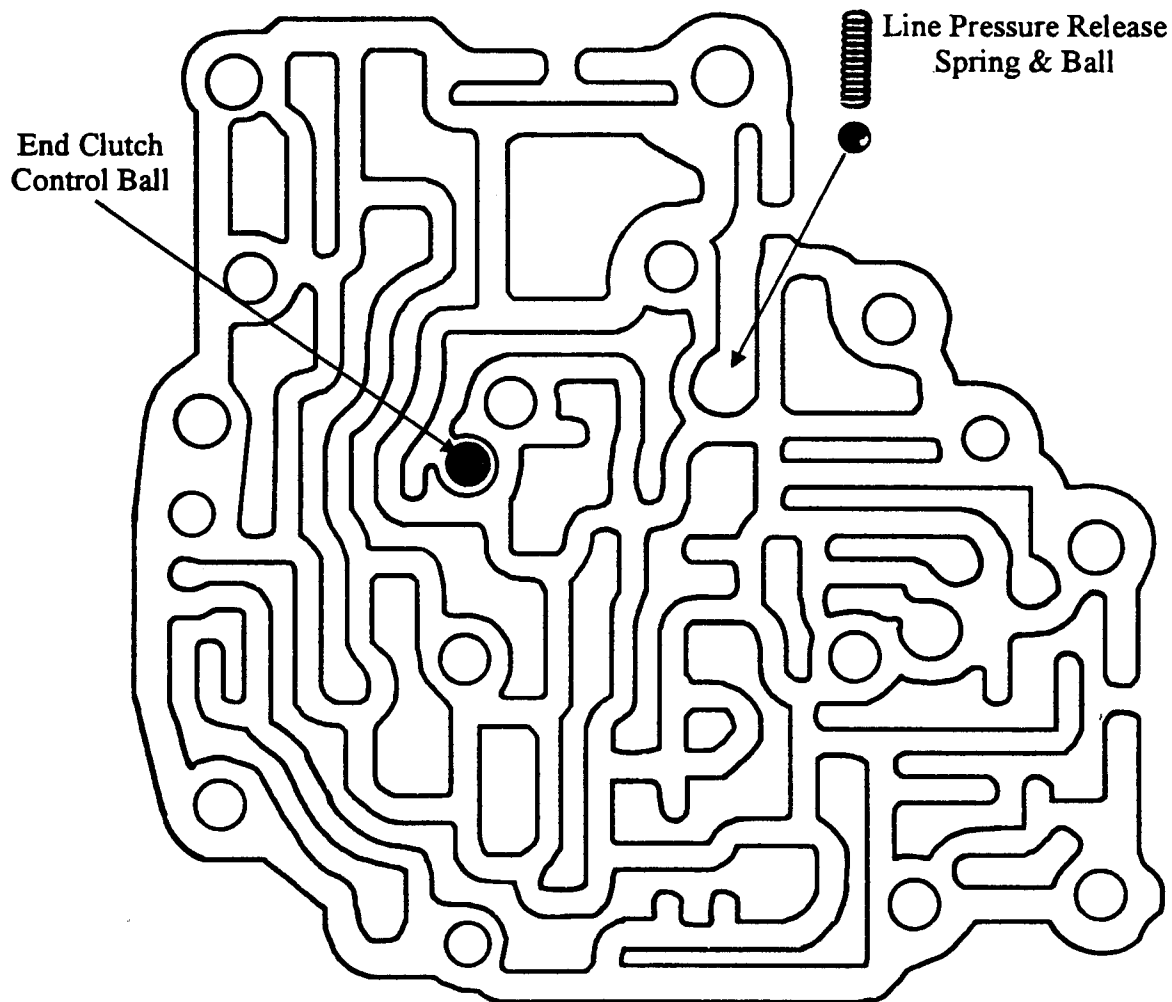
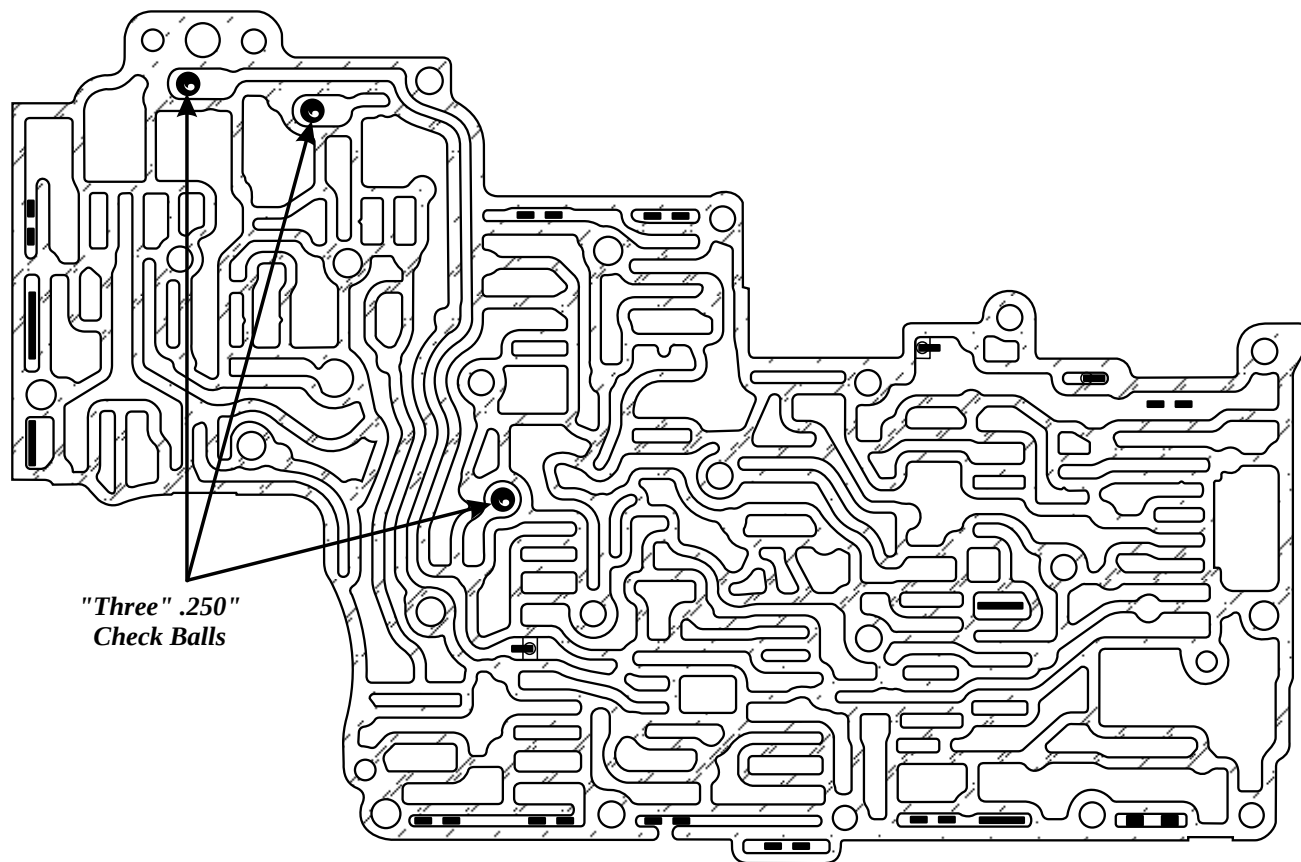


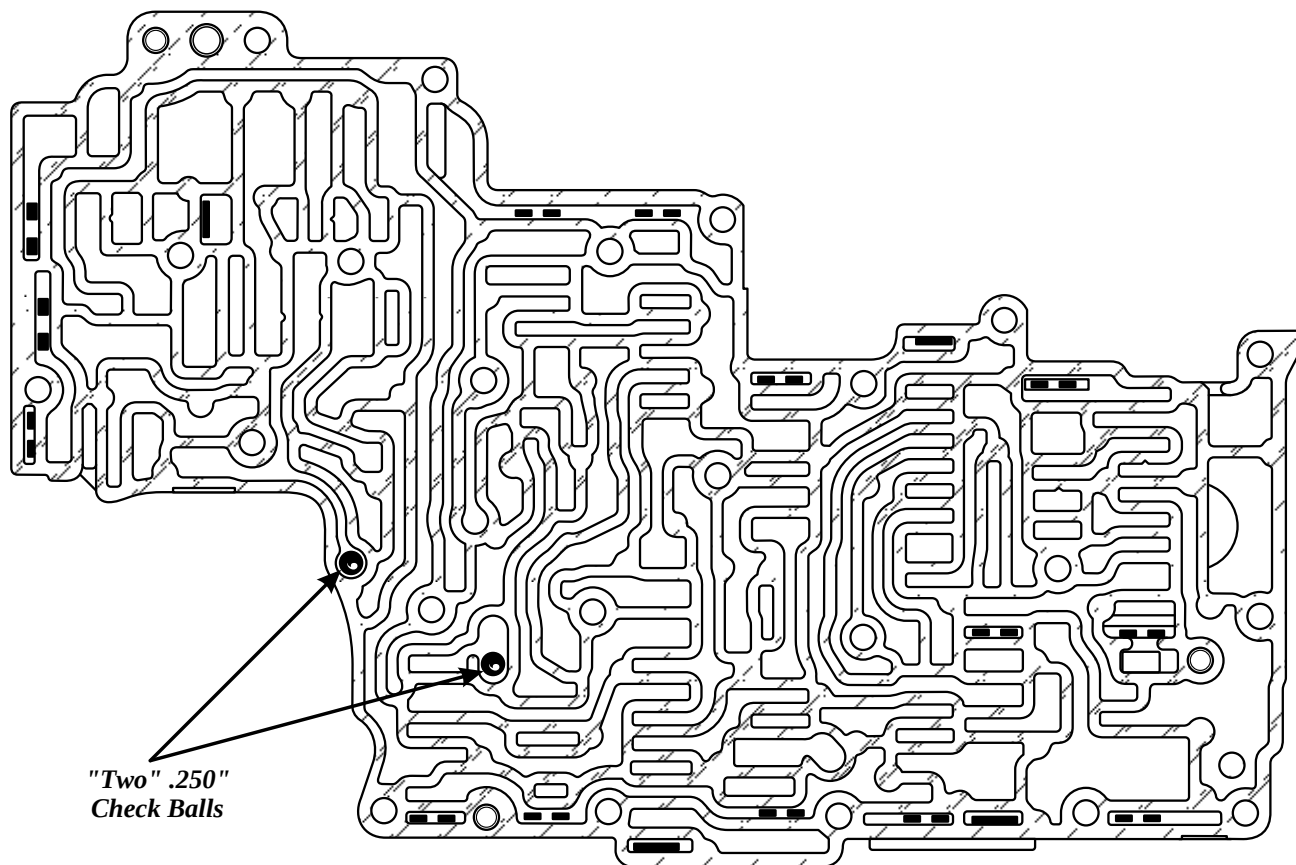
Figure 108

FORD 5R55N "5R55N" VALVE BODY CHECKBALL LOCATIONS



FORD 5R55W

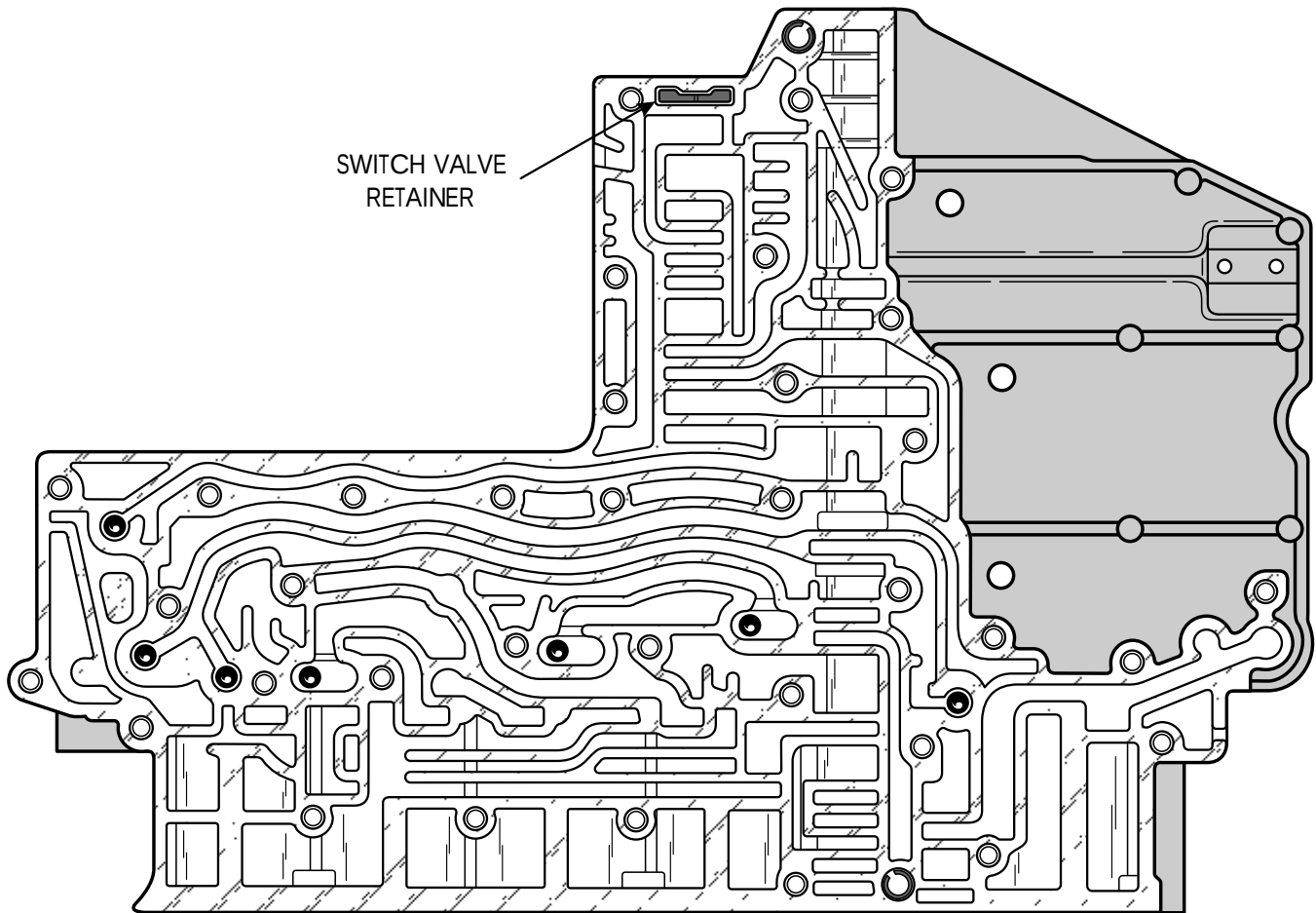
"5R55W" VALVE BODY CHECKBALL LOCATIONS



"Two" .250"
Check Balls

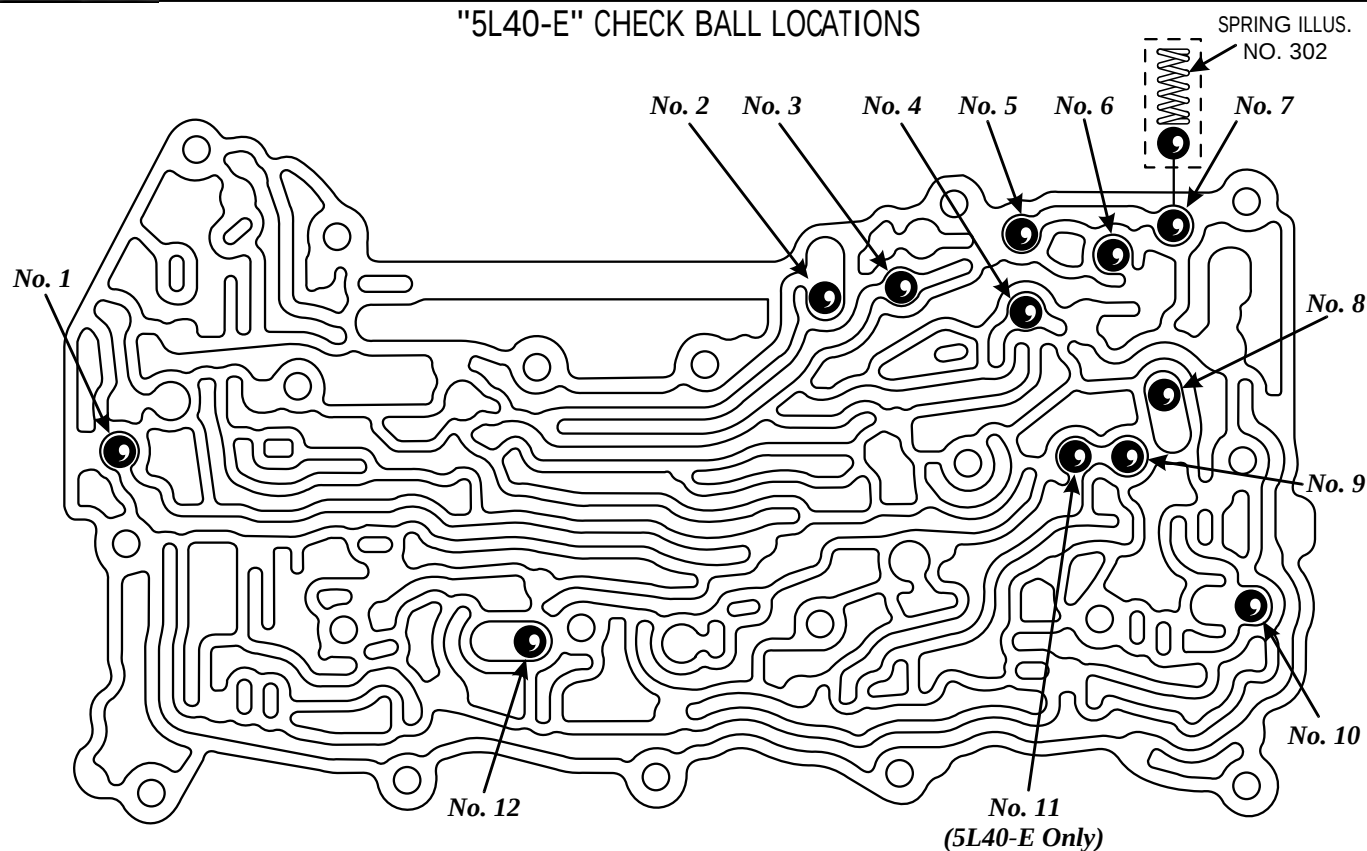
CHRYSLER 45RFE

VALVE BODY CHECKBALL LOCATIONS

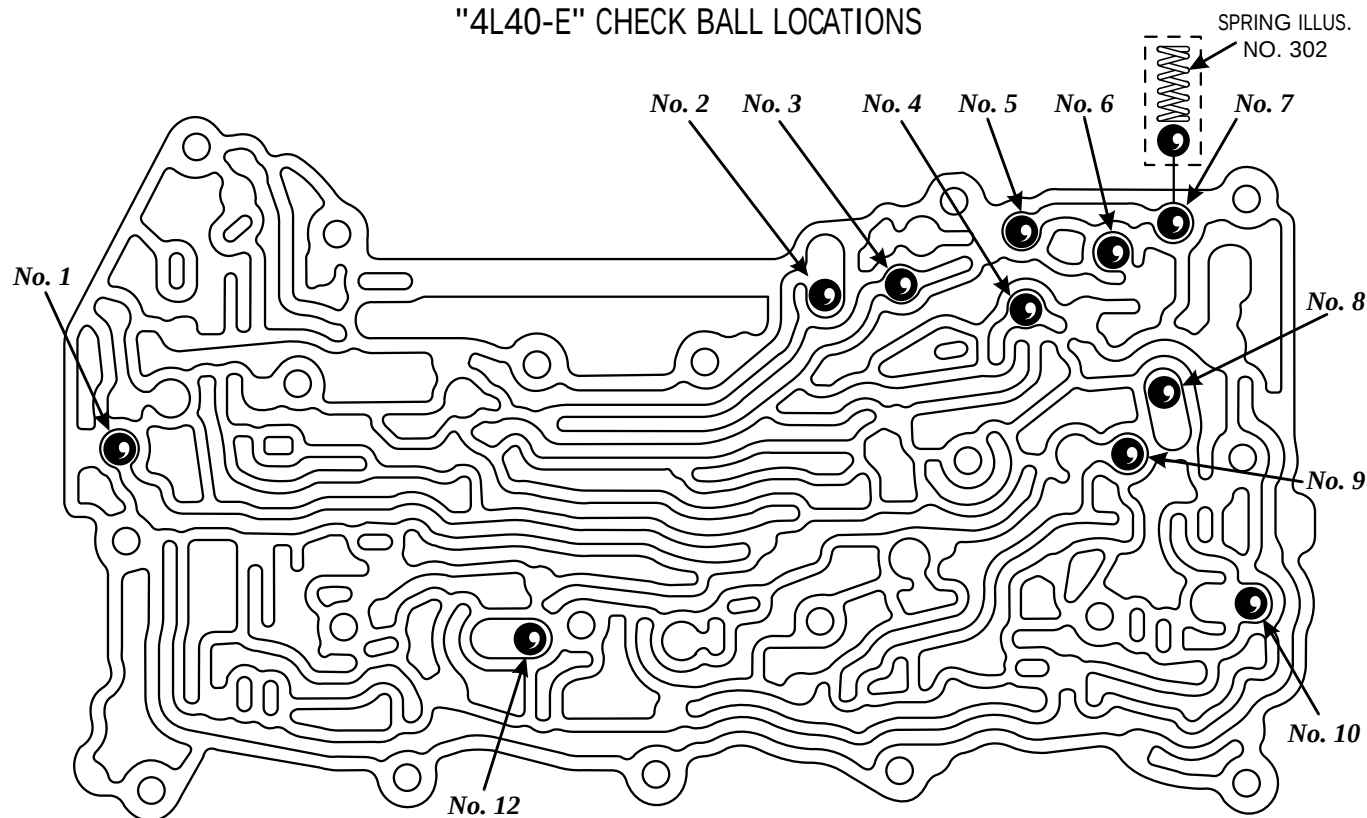


REQUIRES "SEVEN" 1/4" STEEL CHECKBALLS

"5L40-E" CHECK BALL LOCATIONS



"4L40-E" CHECK BALL LOCATIONS

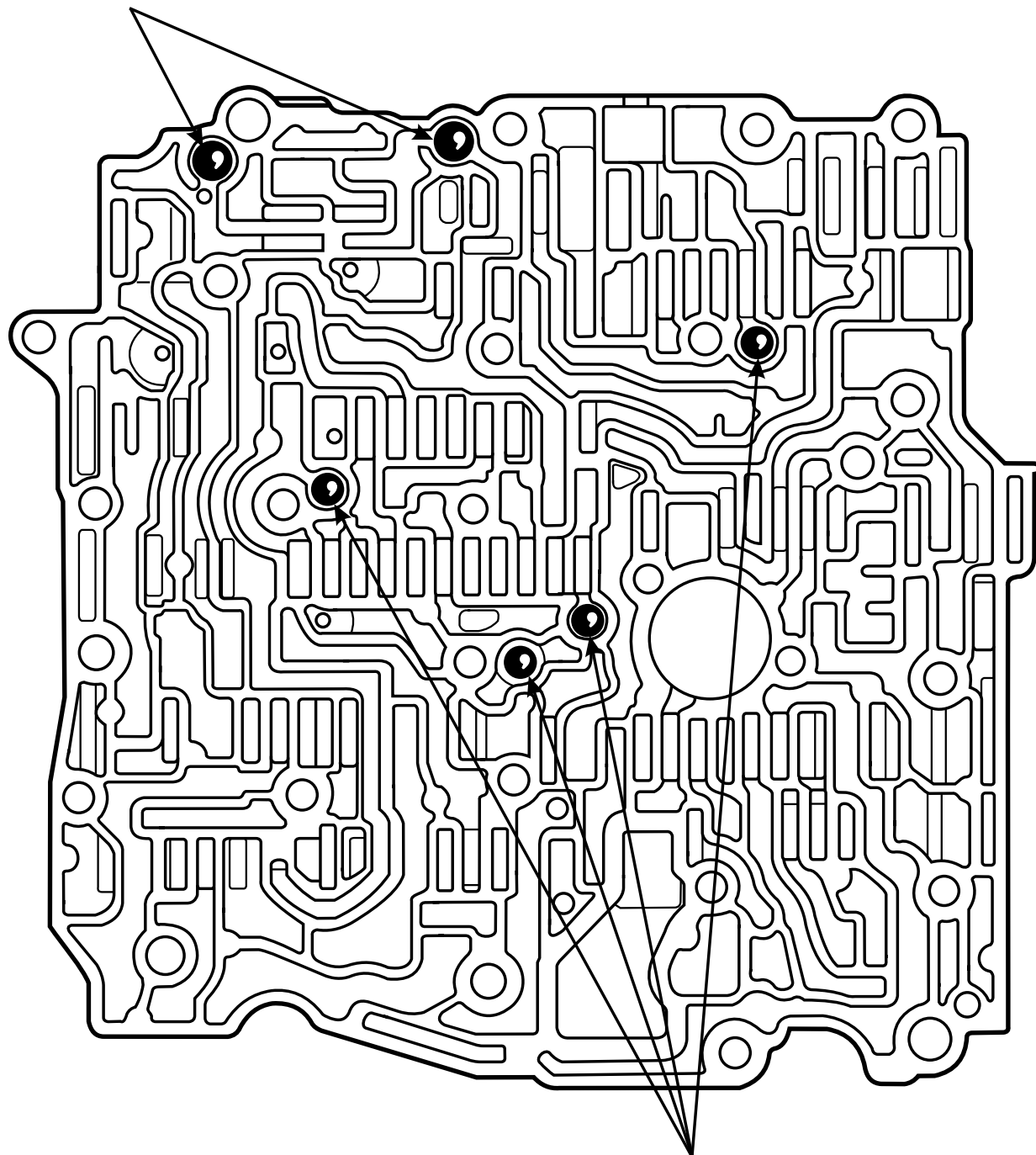


Copyright © 2002 ATSG

Figure 112

THM 4T65-E VALVE BODY CHECKBALL LOCATIONS

.375" DIAMETER
STEEL CHECKBALLS

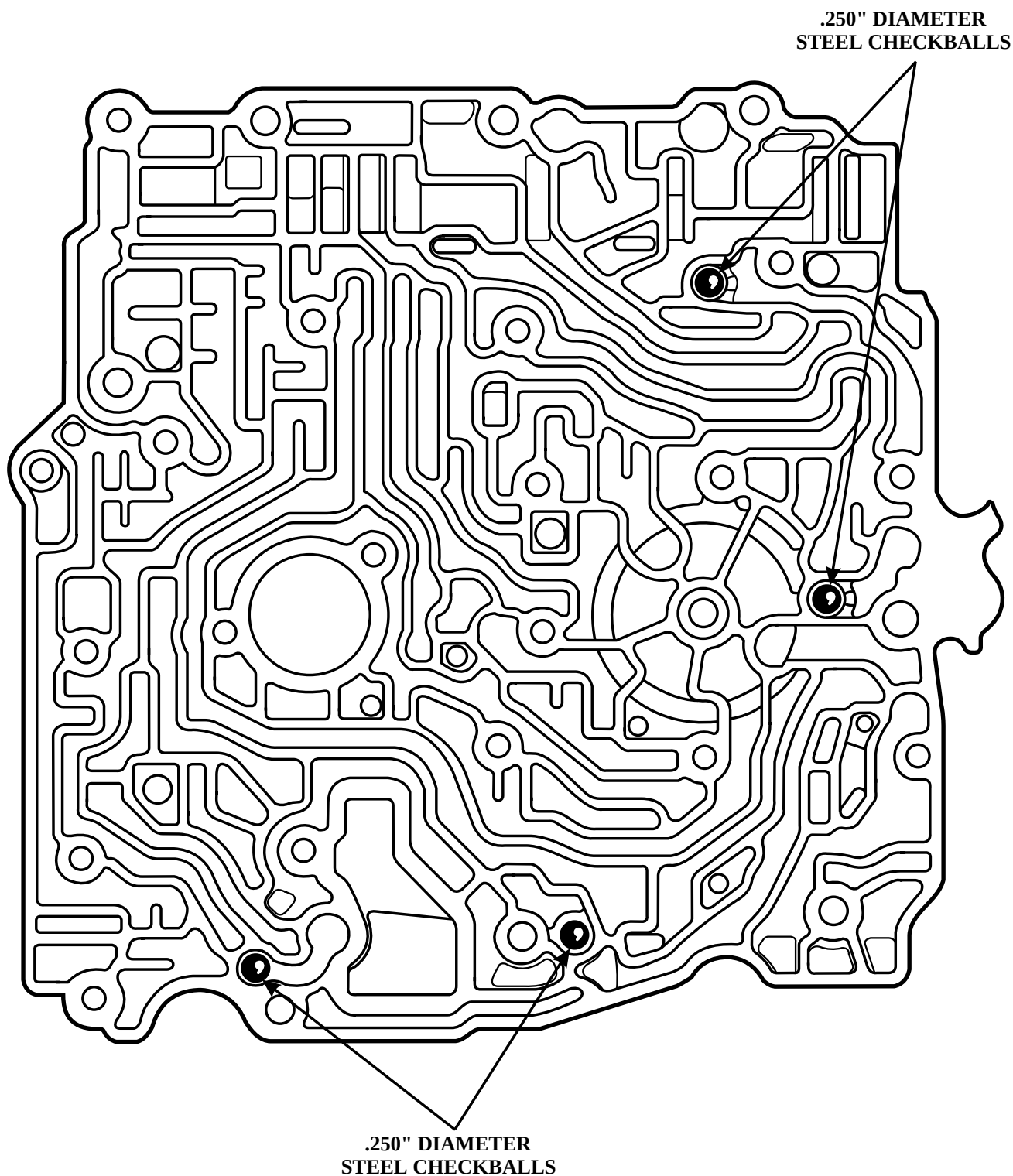


.250" DIAMETER
STEEL CHECKBALLS

Copyright © 2002 ATSG

Figure 113

THM 4T65-E CHANNEL PLATE CHECKBALL LOCATIONS



Copyright © 2002 ATSG

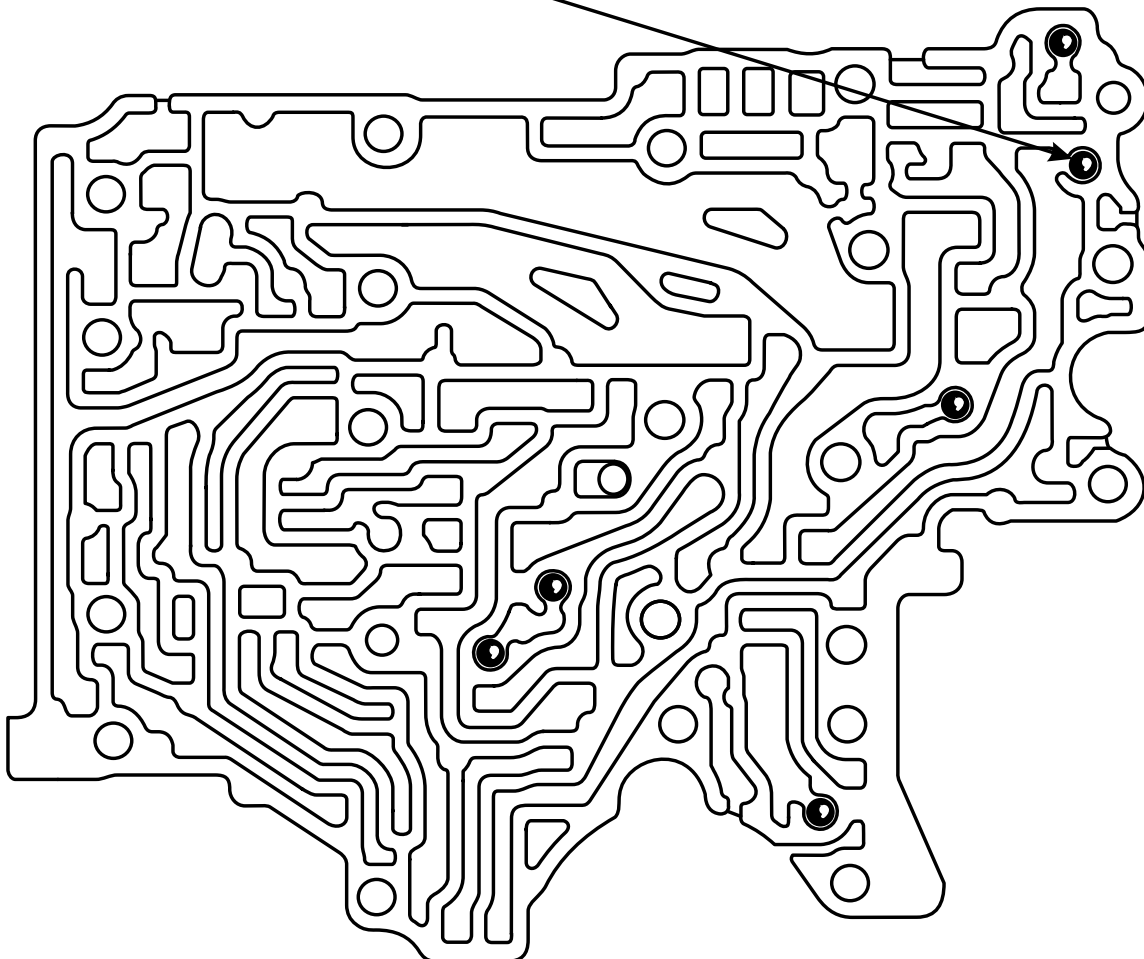
Figure 114

FORD 4F20E

"INTERMEDIATE" VALVE BODY CHECKBALL LOCATIONS

REQUIRES SIX (6) STEEL CHECKBALLS
5.5mm (.217") DIAMETER IN THE
LOCATIONS SHOWN BELOW

*This Checkball Is Omitted
On 1995-Up Models*



Copyright © 2002 ATSG

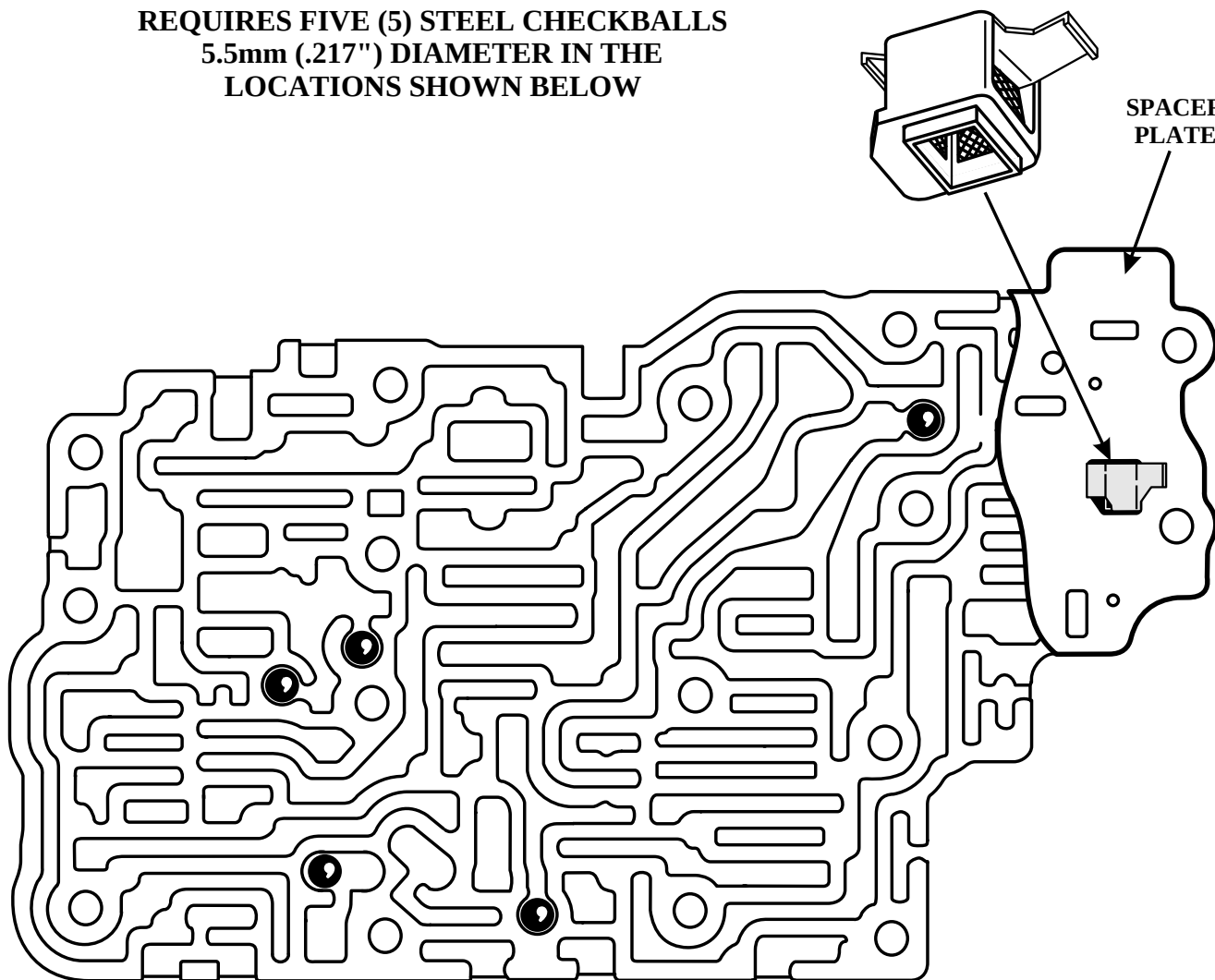
Figure 115

FORD 4F20E "UPPER" VALVE BODY CHECKBALL LOCATIONS

REQUIRES FIVE (5) STEEL CHECKBALLS
5.5mm (.217") DIAMETER IN THE
LOCATIONS SHOWN BELOW

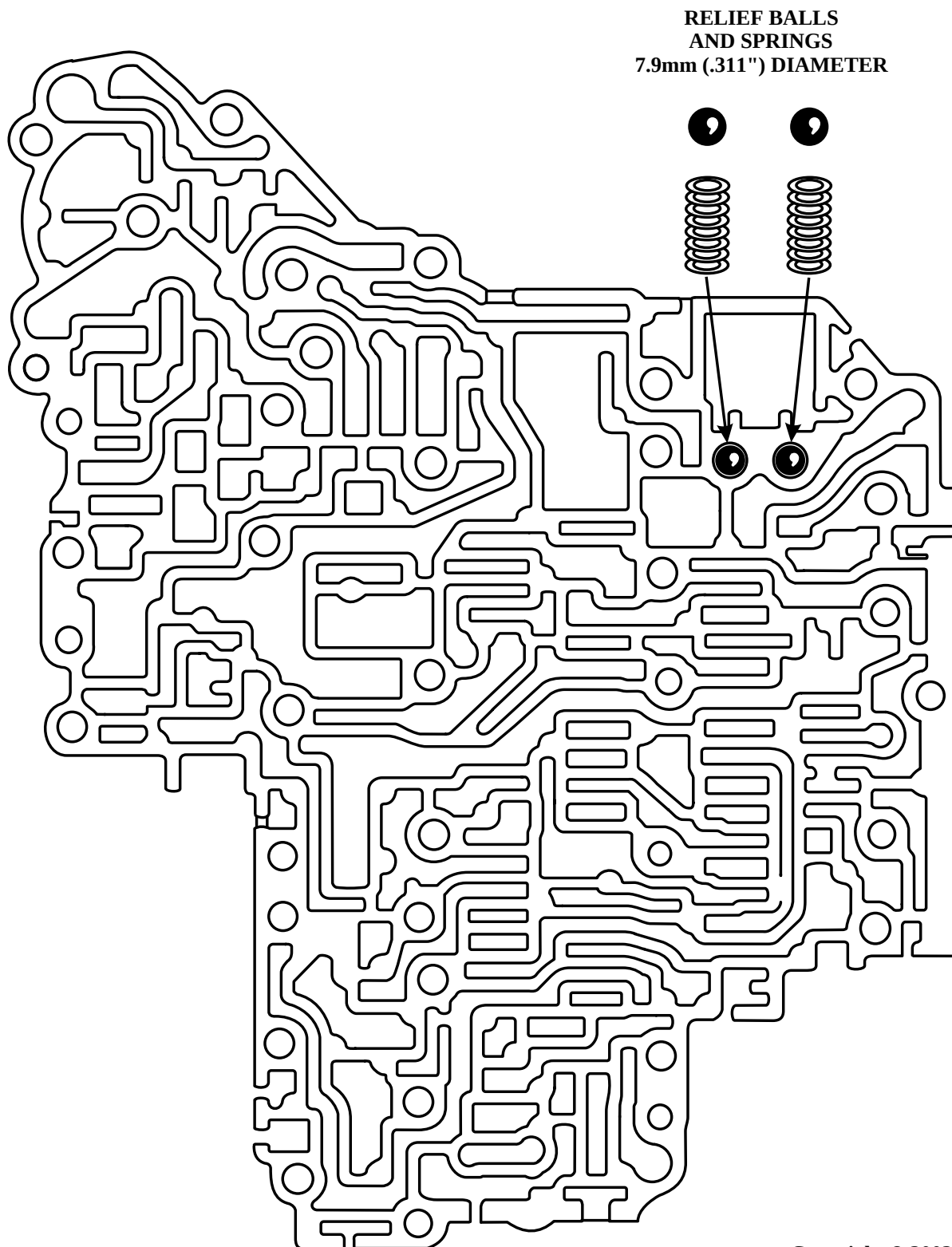
PILOT FILTER INSTALLED
ON SPACER PLATE WITH
LEGS UP AS SHOWN

SPACER
PLATE



FORD 4F20E

"LOWER" VALVE BODY RELIEF BALL LOCATIONS



Copyright © 2002 ATSG

Figure 117